R S G B

MARCH, 1959

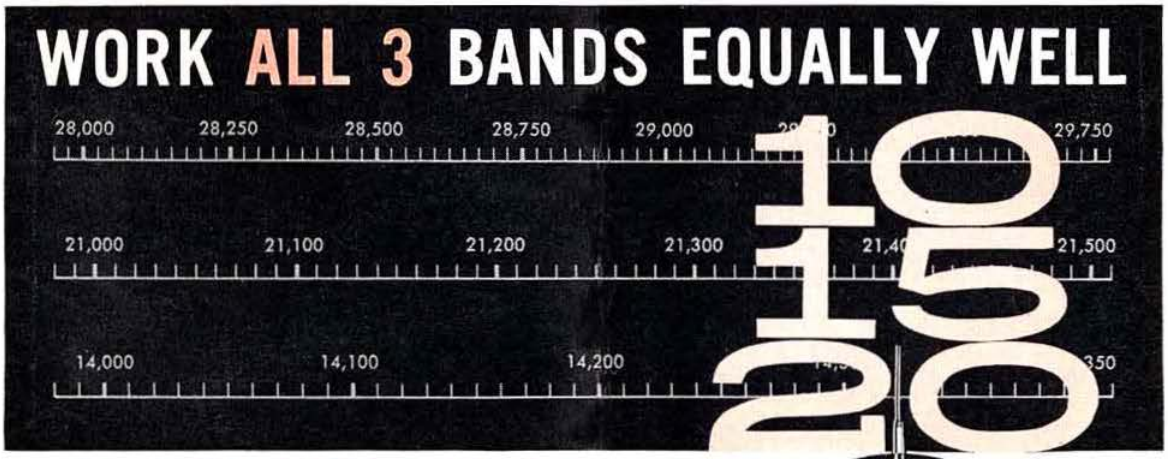
BULLETIN

2/6 Monthly

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

VOL. 34, NO. 9

WORK ALL 3 BANDS EQUALLY WELL



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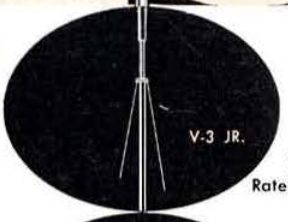
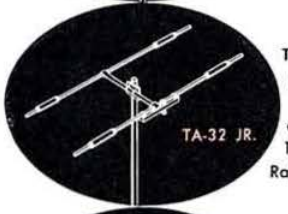


Vertical aerial. 10-15-20M. Rated to 300W.



Two-element rotary beam aerial. 10-15-20M. Rated to 300W.

Three-element rotary beam aerial. 10-15-20M. Rated to 300W.

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Yours sincerely,

Herb Lambert

G5QA.

hab/ch

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0 — 100 V.	0 — 1000 V.	0 — 1 A
0 — 250 V.		
0 — 1000 V.		

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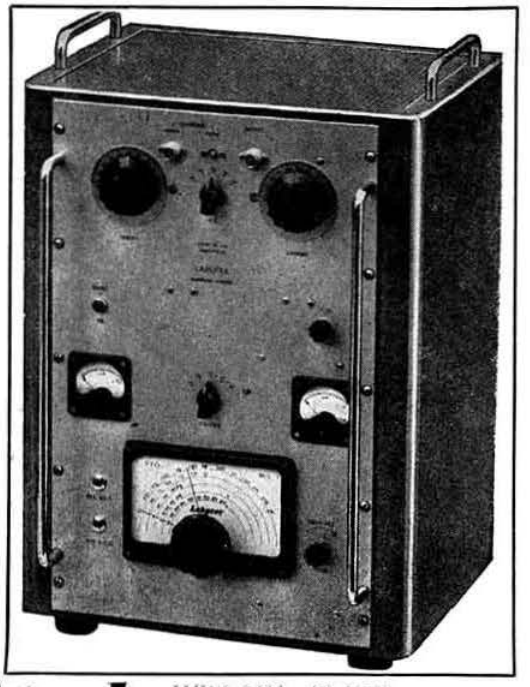

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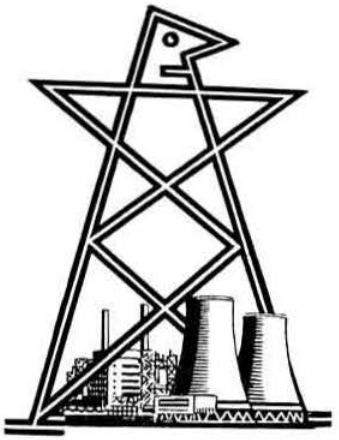

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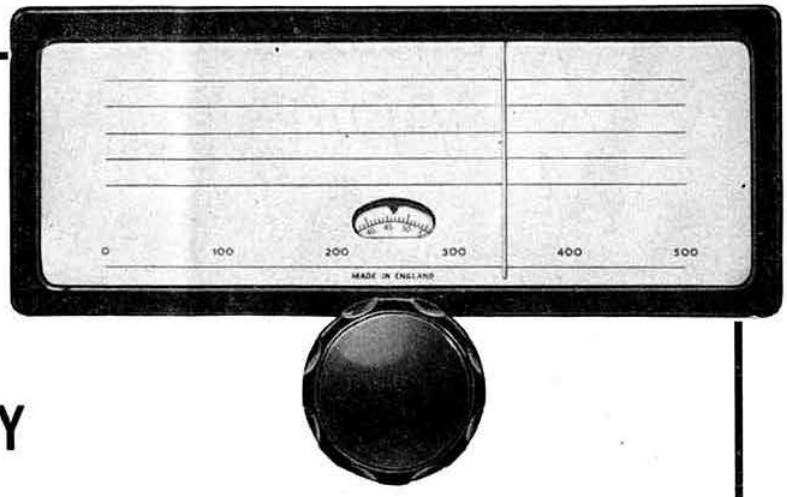

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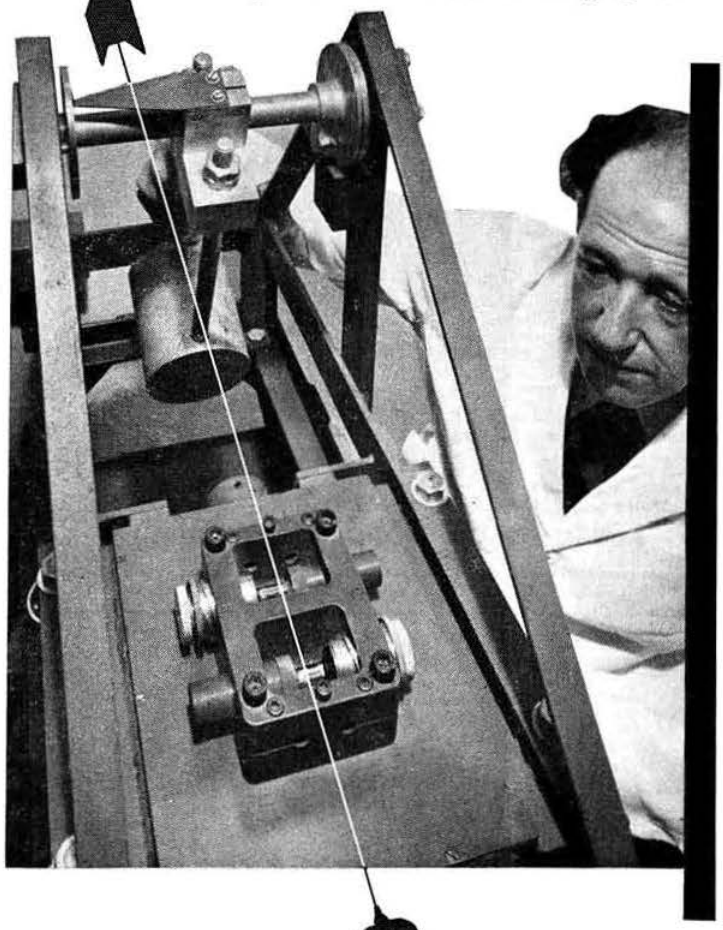

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Volume 34 No. 9
March 1959

R.S.G.B. BULLETIN

CONTENTS

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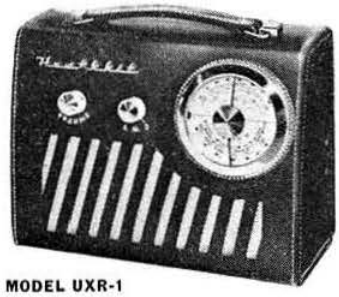

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Current Comment

discusses topics of the day

Radiopositioning

THE growth of radar and associated techniques, and the coming of the "space age," has led to the expansion of the available spectrum for these facilities.

A new term—Radiopositioning—has recently come into the vocabulary to define a form of radiolocation that is different in concept to that which most of us now understand.

Radiolocation is defined, internationally, as "Determination of a position or of a direction by means of the constant velocity or rectilinear propagation properties of Hertzian waves." A proposed new definition for Radionavigation is "Radiolocation intended for the determination of position or direction or for obstruction warning in navigation." It is proposed that Radiopositioning shall be defined as "Radiolocation other than Radionavigation."

The reader may well ask has this anything to do with Amateur Radio? The answer is "yes" because it is expected that both the United Kingdom and the United States will propose at the forthcoming Geneva Radio Conference that in certain of the u.h.f. and s.h.f. amateur bands the Radiopositioning Service shall have priority. These changes are already in effect domestically in the United States; in fact, defence considerations were of sufficient urgency last summer that, in compliance with a request from the United States Office of Defense Mobilisation, the Federal Communications Commission put them into operation immediately.

The effect of these decisions is expected to have little, if any, practical effect on amateur u.h.f. or s.h.f. operation. In an isolated case where an individual amateur is found to interfere with Radioposition work he would be asked to change frequency within the band or take some other steps to alleviate the interference. Restrictions might be placed on amateur stations in the near vicinity of radar installations but such instances are expected to be few and far between.

The amateur bands likely to be affected in the United Kingdom are 420-460 Mc/s and 1215-1300 Mc/s (which are at present allocated to U.K. amateurs on the basis of non-interference with other Services), 2300-2450 Mc/s, 5650-5850 Mc/s and 10,000-10,500 Mc/s.

As far as is known at this writing, the proposals to provide for the Radiopositioning Service are the only ones going forward to Geneva which are likely to affect the Amateur Service.

Within the next few weeks the long awaited Book of Proposals will be published by I.T.U. Headquarters. Not until the proposals have been carefully studied shall we, in the U.K., know what other administrations have in mind. We are led to hope, however, that the Amateur Service will lose no ground at Geneva.

The Canadian Amateur

THEIR friends in other parts of the British Commonwealth must sometimes have wondered why it is that the radio amateurs of Canada have never published a magazine similar to the BULLETIN of the R.S.G.B., *Amateur Radio* of The Wireless Institute of Australia, or *Break-In* of the New Zealand Association of Radio Transmitters. The simple explanation seems to be that there is at present no national Amateur Radio society in the Dominion, such as is to be found in most other parts of the world. It is true, of course, that the interests of Canadian amateurs are—and have been for many years—looked after by the Canadian Section of the American Radio Relay League, but as far as we know this body has no formal constitution and no elected governing body. The Canadian Section of the A.R.R.L. ranks as a Member-Society of the International Amateur Radio Union and its Director—whose election follows regularly at stated intervals—has a seat on the Board of Directors of the A.R.R.L. but the Section does not appear to have a separate financial structure, neither does it issue a balance sheet.

This somewhat unusual arrangement appears to meet the wishes of the majority of Canadian amateurs but we wonder whether a new body may not soon arise to assume the full status of a Canadian national Amateur Radio society.

This month we raise a hand in salute to *The Canadian Amateur*, a new monthly magazine which is intended to serve the interests of radio amateurs throughout the Dominion. The first issue carries the influence of British Columbia, from which province it emanates, but it seems clear, from the editorial content, that future issues will assume a more national outlook.

Among those associated with this new venture are such well-known personalities as Mr. W. E. Wadsworth (VE7ZM) and Mr. John Brown (VE7JB). Mr. Wadsworth will be remembered by many U.K. amateurs as a member of the first Canadian Division to arrive in England during the early months of the last war. Frequently during those dark days he and other Canadian amateurs spoke of their regret that no truly

(*Continued on page 447*)

Some Aspects of Variable Efficiency Modulation as they affect the Amateur

By A. H. KOSTER, Dr.Ing. (G3ECA)*

THERE has always been considerable interest amongst amateurs in transmitters which require small modulators. This is not surprising, because a high power modulator is an expensive item. Such transmitters employ grid, suppressor, screen, clamp valve, controlled carrier, etc. modulation systems. They belong to the category of Variable Efficiency Modulation (in future referred to as V.E.M.) and must not be confused with what is loosely termed High Efficiency Modulation. The latter will be referred to briefly at a later stage.

The familiar anode modulation of triodes and anode plus screen modulation of tetrodes and pentodes belongs to the category of Constant Efficiency Modulation (in future referred to as C.E.M.) ; the efficiency is of the order of 70 per cent for the amateur h.f. bands. Cathode modulation can be either C.E.M., V.E.M. or a combination of both. Let it be said right away that with V.E.M. the valves are always used at a much lower efficiency than with C.E.M. In order to produce a given r.f. output all V.E.M. systems require larger valves with higher ratings of anode dissipation, and higher d.c. inputs than C.E.M. systems. Considering the capital outlay, maintenance and running costs of the two systems, V.E.M. frequently turns out to be more favourable. It must, however, be remembered that the amateur is limited in his available power by the licence conditions and cannot increase his input power indefinitely to make up for the inefficient running of the valves. Nevertheless, providing the amateur appreciates that he is not getting something for nothing but is relieving himself of the formidable cost of an anode modulator at the expense of a loss in power output he will find a number of attractive points in V.E.M. systems.

V.E.M. can be achieved by applying low level modulation to the control, suppressor or screen grid and under certain conditions also to the cathode. Screen grid and suppressor grid modulation are the most popular means, whereas control grid and cathode modulation are somewhat tricky. Screen grid modulation is to be recommended for beam tetrodes, but not for pentodes. The latter can be suppressor grid modulated provided they are designed for this purpose; that is, they must have a linear relationship between suppressor grid voltage and r.f. output, e.g. RK20, PT15, RL12P-35. As to the overriding considerations regarding V.E.M. it is immaterial to which grid the modulation is applied.

Comparison of C.E.M. and V.E.M.

V.E.M. systems are more complicated to adjust than C.E.M. and a better understanding of how they work is necessary. An oscilloscope is a great help and for the more intricate systems indispensable. To get a measure of the problem a C.E.M. transmitter will first be considered by taking the popular arrangement of two 807s with 100 watts input running at 70 per cent efficiency. Table I shows the prevailing conditions.

Table I—C.E.M. (Modulated 100 per cent)

100 watts d.c. input	50 watts a.f. input
(70 watts carrier	(35 watts sidebands
30 watts dissipated)	*15 watts dissipated*)

150 watts d.c. + a.f. total input
105 watts output (carrier + sidebands)
(45 watts dissipated at the anodes
70 per cent efficiency)

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We will now consider, step by step, what happens if a hypothetical changeover is made from C.E.M. to V.E.M. First of all the 50 watts of a.f. input which had been obtained from the modulator is lost; this will be replaced by d.c. so that the d.c. input is now 150 watts. The fact that this will run us into trouble, which is not apparent at this stage, is a side issue for the moment. Something equally important can be seen right away.

"LOOSELY TERMED HIGH EFFICIENCY MODULATION"

The licence conditions state that the *d.c. input* to any kind of p.a. stage must not exceed 150 watts, but they do not refer to the *a.f. input*. The extra 75 watts peak power of a.f. which a C.E.M. transmitter can obtain from the modulator bring the total *peak* input up to 225 watts. The V.E.M. transmitter has no a.f. power input. Hence the permissible peak power input to a V.E.M. transmitter is limited by law to two-thirds of what a C.E.M. system is allowed. In practice 100 per cent modulation occurs only on a.f. peaks and the average level of speech transmission is perhaps 30 per cent. The power required to produce sidebands at an average level of 30 per cent may vary from say 7½ to 25 watts, depending on the modulation waveform. Taking the average again a C.E.M. transmitter uses about 16½ watts out of its extra allowance of 75 watts, but the reserve power is there when called on at modulation peaks. The V.E.M. transmitter cannot be provided with this standby power.

Returning to the hypothetical two 807 p.a. stage which has 150 watts of d.c. input at its disposal, the valves have to be persuaded to convert this d.c. input into a modulated carrier. For 100 per cent modulation there will be, as is normal for all forms of amplitude modulation, two-thirds carrier and one-third sidebands. At 70 per cent efficiency the two 807 p.a. can supply 105 watts of r.f. which have to be split up into a carrier and sidebands. Assuming, for a moment, that under V.E.M. operation 105 watts could be produced, Table II shows the prevailing conditions.

Table II—V.E.M. Modulated (hypothetical case)

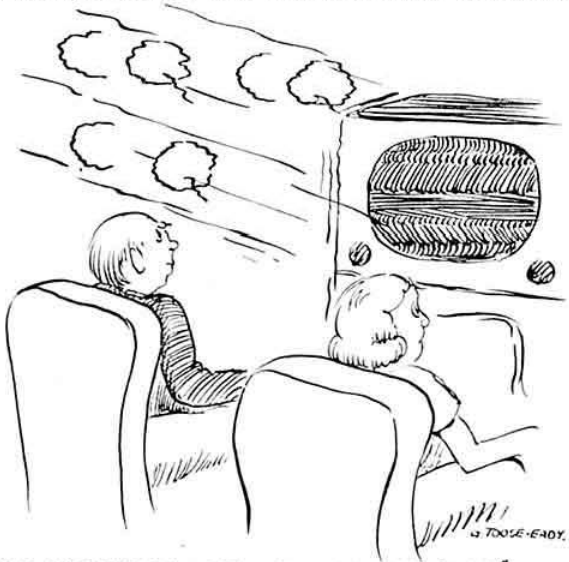
150 watts d.c. input
70 watts carrier
35 watts sidebands
105 watts total r.f. output
(45 watts dissipated at the anodes
70 per cent efficiency)

If the modulation is now removed, it will become apparent that the p.a. stage is wrongly adjusted and cannot, or should not, be operated in this way. If the modulation is taken off, the sidebands will disappear. Table III shows the new conditions.

Table III—V.E.M. Unmodulated (hypothetical case)	
150	*watts d.c. input*
70	watts carrier
0	watts sidebands
70	watts total r.f. output
(80	watts dissipated at the anodes
46½	per cent efficiency)

Varying the Efficiency of the P.A. Stage

The first thing to be noticed is that two 807s cannot dissipate more than 50 watts at the anodes. Before suggesting a remedy, a second point will have to be taken into consideration. Variable Efficiency Modulation, as its name implies, operates by varying the efficiency of the p.a. stage. For satisfactory and linear 100 per cent modulation the troughs of the modulating a.f. wave bring the efficiency to zero and



"THE AMATEUR IS LIMITED IN HIS AVAILABLE POWER"

the crests double whatever it was in the unmodulated condition. According to Table III the efficiency at zero modulation is 46½ per cent, hence it would have to go up to 93 per cent on peaks. However, the efficiency of the valves is only 70 per cent. From this it can be calculated that the hypothetical case is practicable only if peak modulation is kept below 50 per cent and simultaneously a hurricane is blown over the valves to assist the anode dissipation! Any increase in modulation will result in the varying forms of distortion that can be heard over the air if some misguided amateur is reaching for the impossible.

The utterly hopeless case (Tables II and III), has been brought in deliberately because it is the most common fault made by amateurs; apart from the annoyance it creates for others, many a good valve has come to an untimely end with one last display of internal fireworks.

In order to put matters right the efficiency of the unmodulated valve has to be reduced to at least 35 per cent and to ensure linearity 33⅓ per cent is a reasonable figure. This will increase the anode dissipation still more and instead of two single 807s, two pairs in push-pull or one single-ended 813 are required. The operating conditions are shown in Table IV.

Table IV—V.E.M. (Unmodulated)	
150	*watts d.c. input*
50	watts carrier
0	watts sidebands
50	watts total r.f. output
100	watts dissipated at the anodes
33⅓	per cent efficiency

The p.a. stage is now properly adjusted and will modulate linearly 100 per cent. The corresponding figures are shown in Table V.

Table V—V.E.M. (Modulated 100 per cent)	
150	*watts d.c. input*
50	watts carrier
25	watts sidebands
75	watts total r.f. output
75	watts dissipated at the anodes
50	per cent efficiency

The facts concerning a properly adjusted V.E.M. transmitter, as can be deduced from Tables IV and V, and which apply to any d.c. power input, are summarised as follows:

(a) The unmodulated carrier power is one-third of the d.c. input.

(b) The 100 per cent modulated carrier power is one-half of the d.c. input.

(c) The anode or anodes must be capable of dissipating two-thirds of the d.c. input power.

(d) The available r.f. output, modulated or unmodulated, is about one-half of that produced by a C.E.M. transmitter.

The Most Expensive Item in Amateur Radio

The last fact (d) is somewhat distressing to those who definitely want to get the maximum power. The operator who is satisfied with one-half of it can build a relatively cheap transmitter. Looking at it in terms of db and receiver S-points, the power is 3db down and about one S-point is lost at the receiver, whereby it will be appreciated that the S-scale is a rather arbitrary affair. If the half power can still operate the a.g.c of the receiver, doubling it will not make any difference. In other words as far as signal strength at the receiving end is concerned, there is not much to choose between half or full power. But if a carrier has to compete with other interfering signals, the signal-to-noise ratio deteriorates rapidly if the carrier power is reduced.

This last S-point is the most expensive thing in Amateur Radio. If an amateur loses 3db or more in a bad aerial, which can easily happen, he may never know and be proud of his achievements for ever after, but here is an S-point he

"IN PRACTICE 100% MODULATION OCCURS ONLY ON PEAKS"

does know about. To regain it by a changeover from V.E.M. to C.E.M., a modulator is required which is capable of producing 100 watts of audio, i.e. at 75 per cent transfer efficiency it leaves the necessary 75 watts. Such equipment is expensive and it is sound reasoning to let that S-point go and use a modulator with an output of ½ to 4 watts depending on the V.E.M. system used.

Optimum Load

One interesting feature of V.E.M. is that the optimum load for the p.a. is half that of C.E.M. This means that the capacity in the tank circuit has to be doubled, which is useful on the 10 and 15 metre bands. Frequently the optimum capacity for C.E.M. works out to be so small that it is less than the strays and the Q has to be raised beyond the proper value to get a means of tuning.

"THIS MODULATION METHOD MAY BE ATTRACTIVE"

Controlled Carrier Modulation

Tables IV and V reveal that without modulation the anode dissipation is 100 watts, but fully modulated it is only 75. Hence with modulation the valves run cooler. With C.E.M. the opposite is the case, naturally both figures being lower, i.e. 45 watts without and 67½ with full modulation, for the same d.c. input of 150 watts. This property of V.E.M. can be utilized in an effort to regain some of the lost efficiency. The d.c. input power can be automatically increased as the modulation level rises, and this process is known as controlled carrier modulation. However, an amateur is not allowed to increase the d.c. input above 150 watts. The only benefit he can draw from this artifice is to employ slightly smaller valves with an anode dissipation of 75 watts instead of 100. The operating conditions for the unmodulated carrier in such a case are shown in Table VI.

Table VI—V.E.M. (Unmodulated)

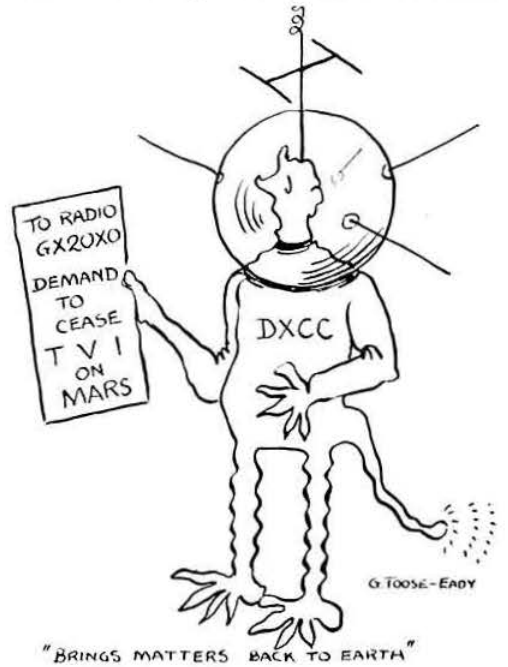
112½	*watts d.c. input*
37½	watts carrier
0	watts sidebands
37½	watts total r.f. output
75	watts dissipated at the anodes
33⅓	per cent efficiency

As modulation is applied, the d.c. input, the carrier, the total r.f. output and the efficiency increase, but the anode dissipation remains the same, until with 100 per cent modulation the conditions shown in Table V are reached. This automatic control is achieved by rectifying a small amount of the modulation a.f. and applying the voltage, which, subject to a small integrating time constant, will be proportional to the prevailing modulation level, in a suitable fashion to one of the grids. For mobile equipment and where valve size and power are of importance this modulation method may be attractive, but in general the amateur might prefer to use the larger valves and save himself the complication.

In view of the changing input the anode load changes too, and unless something is done to correct for it, non-linear modulation will result. The linearity can be improved by inverse feed-back which is a fairly simple thing to do. Controlled carrier operation can be applied to such an extent that the carrier is practically brought to zero when modulation ceases. This leads to further economy in valve size, but does not entitle the amateur to increase the peak power. In fact, controlled carrier modulation will always reduce his average power and offers him no compensation on the peaks.

Terman-Woodyard System

The Terman-Woodyard system, and its derivations, are in a different class. These so-called High Efficiency systems are not V.E.M. systems in the true sense, and are similar only in that they apply modulation to the grids. Whereas C.E.M. changes the input from 150 watts d.c. for 0 per cent modulation to 225 watts (d.c. + a.f.) for 100 per cent, the Terman-Woodyard system changes from 150 watts d.c. to 225 watts d.c. This is permissible under the licence conditions which make the appropriate concession, with the proviso that the unmodulated carrier does not take more than 150 watts of d.c. input, which also implies that the carrier component must not increase during modulation. In the previously discussed controlled carrier operation, Tables VI and V, the carrier does increase and, therefore, this concession is not applicable to that case. The Terman-



"BRINGS MATTERS BACK TO EARTH"

Woodyard type of systems employ ingenious methods of converting d.c. power into r.f. sidebands without the costly intermediate stage of converting d.c. first into a.f. and then into sidebands. When properly adjusted these systems produce good results, have the same efficiency and power output as C.E.M. systems, and are cheaper. It would be misleading, however, to say they are easy to adjust. A good knowledge of how they work and how to interpret the oscilloscope traces is essential. A set of adjustments made for a particular amateur band will hold over frequencies in that band, but when it comes to changing the band they do not. These features have prevented such systems from becoming popular in amateur circles. Terman and Woodyard introduced their system in 1938 and it has not been appreciably simplified since its inception. The last advance was made by Moxon[1] in 1951, but his simplification was still not enough to bring it within reach of the average amateur's means of transmitter adjustment and control. The Taylor and other supermodulation methods met with the same fate.

This brings the discussion back to the pure V.E.M. systems which are comparatively easy to handle, but suffer from the poor return in r.f. output for a given d.c. input. If the G.P.O. would make a concession, similar to the one already made for the Terman-Woodyard type of systems, by permitting a total d.c. input equivalent to the maximum d.c. plus a.f. input of a C.E.M. system, i.e. 225 watts d.c., matters would look a little brighter, but still leave the amateur at a disadvantage. The resulting figures are shown in Table VII.

Table VII

V.E.M. (Unmodulated)	V.E.M. (Modulated 100 per cent)
225 *watts d.c. input*	225 *watts d.c. input*
75 watts carrier	75 watts carrier
0 watts sidebands	37½ watts sidebands
75 watts total r.f.	112½ watts total r.f. output
150 watts dissipation	112½ watts dissipation
33⅓ per cent efficiency	50 per cent efficiency

In order to equal in power-output terms the C.E.M. systems (i.e. 105 watts carrier plus 52½ watts sidebands), the input power would have to be raised to 315 watts d.c.

The fact that the case in Table VII produces about the same results as the far more efficient C.E.M. arrangement in Table I (which has a pair of 807s in the p.a. and perhaps a pair of 6L6s in a class B modulator) brings matters back to earth. To sum up, a V.E.M. transmitter, running an 813 or four 807s at 150 watts d.c. input, can be fully modulated by a minute a.f. power, but its r.f. output is limited to a 50 watt carrier plus 25 watts of sidebands, and there is no simple artifice which will improve this output.

Reference

[1] " High-Efficiency Grid Modulation," L. A. Moxon, B.Sc. (G6XN), R.S.G.B. BULLETIN, October and November, 1951.

TWO METRE GROUND PLANE AERIAL (contd.)

of a quarter wavelength and the radials slightly longer, but it would be better to start with all the elements longer than necessary and prune to resonance.

The changes that can be rung on the original idea are very numerous, and the arrangement lends itself admirably to individual requirements. It is possible, for instance, to arrange another funnel upside down below the first and treat the edges with a suitable adhesive so that the two funnels form a virtually air- and damp-proof chamber. This could be used to seal the connections to a normal dipole or beam.

A Simple Two Metre Ground Plane Aerial

By D. P. J. MEAD (G3IDM)*

THE aerial described below may be of interest to two metre enthusiasts who desire a lightweight and simple omnidirectional system for local work. An obvious choice is a vertical aerial of the co-axial or ground plane type, and in looking around for a quick, cheap and simple method of construction, the following idea was evolved.

The centre of the design is an ordinary household funnel of the polythene variety sold for a few pence. The vertical radiator is ½ in. diameter dural or aluminium tube pushed up through the spout of the funnel, which may need some trimming as the holes in some of these funnels are a trifle small for half-inch tube. Four small holes are pierced at equal distances round the edge of the funnel part, about half an inch from the rim. The radials of ⅛ in. diameter material are pushed through these holes from the inside.

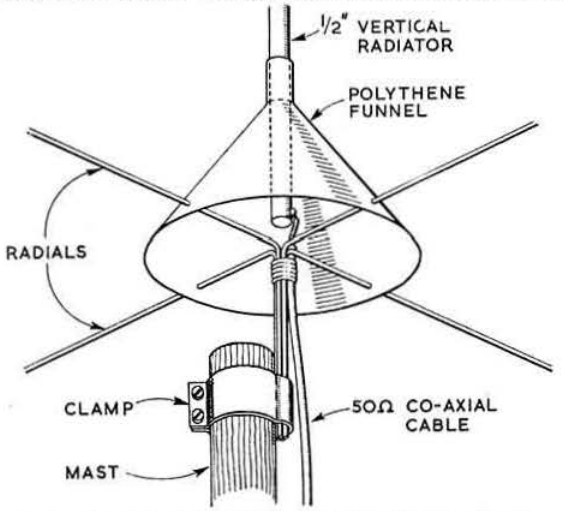


Fig. 1. Arrangement of the simple two metre ground plane.

The termination can be a matter for individual ingenuity. At G3IDM a large co-axial socket from the T1143 is used. The ends of the four radials were flattened and drilled 6BA clearance, and then bolted to the four corners of the flange. The end of the ½ in. vertical radiator was plugged by a metal insert which was drilled and tapped 4BA in the centre and screwed on to the back of the socket, leaving the actual socket free to be plugged on to a co-axial plug fixed rigidly to the mast. This enables quick changes of aerial to be made. Another idea would be to bend the four radials downwards at right angles, and clip the spur so formed to the mast, the co-axial cable braiding being soldered to the junction of the radials, and the inner conductor bolted to the vertical portion. Numerous other ideas will present themselves to those interested.

The impedance of the aerial is about 36 to 40 ohms, but no serious mis-match should be present if 50 ohm cable is used. The impedance can be quadrupled if another ½ in. tube is run parallel to the vertical radiator and connected to it at the top, going down through the funnel and joining the radials. The vertical radiator should be about 95 per cent.

Continued in other column

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A Simple Capacity Bridge

By W. H. ALLEN, M.B.E. (G2UJ)*

THE well stocked junk box, frequently referred to by those about to describe the construction of a piece of equipment, often contains a number of assorted fixed condensers the value of which is pure speculation due either to the impossibility of reading those smudgy black figures printed on the protective wax coating of the component, the maker's private colour code which appears to have no common ground with anything to be found in the reference books, or the absence of any markings whatever, which is frequently the case with condensers removed from surplus equipment.

The only way to put these components to use is to have some means of measuring their capacity. In the majority of cases great accuracy is not required—after all, the normal tolerance is 20 per cent—so the acquisition of a sub-standard capacity bridge, although very nice to show off to envious visitors to the shack, is certainly not worth the price one would have to pay for such accuracy.

True to form, the bridge to be described was the result of a search through the junk box and is capable of wide variations in both its components and layout to suit the particular heap of bits and pieces which the reader is just about to throw away.

The design of bridges is legion, but in the majority of cases a wire-wound potentiometer is used as the variable arm. This is excellent provided it is a really sound component. Unfortunately good wire-wound " pots " cost money and they are unlikely to be found lying around with nothing to do. Trying to make do with one in which minor disconnections occur at odd spots on the track is just a waste of time, so having acquired a new and well built four-gang variable condenser with a capacity of 350 pF per section at the local junk sale for the price of one shilling it was decided to use this as the variable arm and to switch the resistive components of the bridge to give a total of three ranges.

The Circuit

The circuit adopted is shown in Fig. 1 and enables capacities from 5 pF to 10,000 pF to be measured without any undue crowding of the readings at any part of the scale.

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Naturally, the use of a variable condenser in this manner restricts the bridge to the measurement of capacity only, but this was all that was required, the measurement of resistance being adequately dealt with by an existing ohmeter. On the credit side, there were no difficulties arising from poor contacts in the condenser as might well occur in other than a first class variable resistance.

The signal applied to the bridge is provided by a simple audio oscillator, the circuit employed being unimportant so long as the output is reasonably pure, as harmonics tend to blur the null position. It is an advantage to have a fairly high note in the range 800 to 1,000 c/s, as most headphones are more sensitive to frequencies of this order

The constants in the circuit shown suited the particular valve and a.f. transformer employed, but the only value likely to require alteration to suit another transformer is R1 which governs the degree of feed-back applied. Using as high a value as possible consistent with steady oscillation has a direct bearing on the purity of the output waveform.

Only a few volts of a.f. are required as an excessive input to the bridge leads to shocks being felt at the " X " terminals and a high residual signal at the null point due to leakage. With full h.t. voltage applied, the author's oscillator (used with an a.f. choke in the anode circuit) produced some 180 volts of audio, so this was considerably reduced by doing away with the choke and inserting R2 to cut down the output until a reasonably loud signal was obtained off balance combined with a sharp and clean null position at the point of balance. Before finally deciding upon the value of R2 tests should be made to ensure that these conditions are satisfied at both the high and low capacity ends of the coverage.

For economy in components the valve heater was supplied direct from the mains with a condenser of suitable value in series. The valve in question, a Telefunken RV12P2000 r.f. pentode acquired during the war by courtesy of the Luftwaffe, was chosen because its 12·6 volt heater consumed only 0·075 amps and ran at the rated current with a one microfarad condenser in series. For a larger current a greater capacity would be required, and as a guide a 2 μF condenser is suitable for a current of 0·15 amps. A low heater current consumption is an advantage with this system as otherwise the series capacity becomes unwieldly and it would be easier to use a small transformer. It should be emphasized that the series condenser must be capable of carrying the required current with practically the whole mains voltage across it.

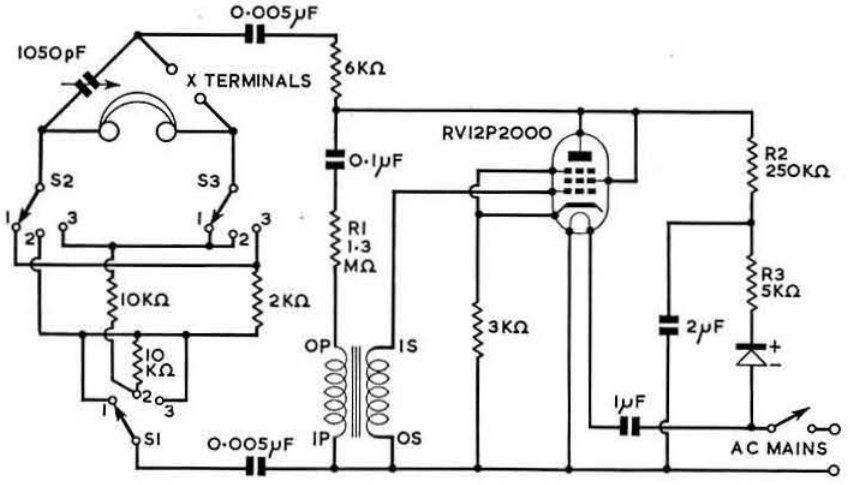


Fig. 1. The bridge and oscillator circuits. It is important that switch S1 should be at the earthy end of the circuit in order that a clearly defined null point be obtained. The purpose of the 6,000 ohm resistor in series with the output of the oscillator is to prevent too low a load being applied to the latter. The value is not critical. Almost any valve will function as oscillator provided the precautions mentioned in the text are observed. For those who wish to use a different valve, the characteristics of the RV12P2000 are as follows: Va= 210 volts; Ia = 3 mA; Vg_2 = 75 volts; Ig_2 = 0·6 mA; Vg_1 = −2·5 volts; gm = 1·5 mA/V.

The very modest h.t. requirements are looked after by a half-wave metal rectifier (R.A.F. reference 10DB/1408) with 16 plates $\frac{3}{4}$ in. diameter—type unknown—R3 being inserted to reduce the voltage across both the rectifier and the smoothing condenser.

With the variable condenser alone, and equal resistors in the two upper arms of the bridge, the range of measurement is equal to the capacity swing of the condenser, say 50 to 1,000 pF. By varying the ratio of the resistive arms the range of measurement will be varied in accordance with that ratio, and in this case it was made 1:10 in switch position 1, 1:1 in position 2 and 10:1 in position 3, giving ranges of 5 pF to 100 pF, 50 pF to 1,000 pF, and 500 pF to 10,000 pF respectively. The actual values of resistance employed are not critical—it is the ratio which is important—and although two 10,000 ohm and one 2,000 ohm components were used, the substitution of a pair of 25,000 ohm and one 5,000 ohm resistors made no difference to the operation.

Due to a lucky number in the raffle at the last London V.H.F. Convention a number of Painton precision resistors were on hand, and it was not difficult to pick out the ones required. Failing this, suitable high-grade resistors (they only require to be of $\frac{1}{4}$ watt rating) may be purchased. Alternatively components selected with the aid of a meter and battery from the existing stock can be used. The accuracy of the bridge depends upon the matching of these resistors and care taken in this respect is well worth while.

A Warning

As no mains transformer is employed it is most important, from the point of view of safety, that there should be no metallic connection between the bridge (which includes the headphones) and either side of the a.f. oscillator. The two 0·005 μF isolating condensers must, therefore, be above suspicion, preferably with mica insulation and with a rating of at least 1,000 volts working.

All parts were assembled on a piece of ebonite, which provides the necessary insulation for the frame of the variable condenser, and a plywood panel cut to fit an existing metal box. The latter was not connected in any way with the bridge or oscillator.

Calibration

The pointer for the variable condenser was made from a strip of Perspex screwed to the underside of a large knob. A thin line was scribed on the centre line of the pointer nearest to the panel and three holes, $\frac{1}{16}$ in. in diameter, drilled along it. A piece of thick card formed the scale and by passing the lead of a propelling pencil through each hole in turn and rotating the knob, three semicircular scales were produced. Calibration marks were made by the pencil through the holes in a similar manner, short radial lines and the values then being added. When calibration was finished the scale was given two coats of paper varnish for protection.

The calibration was carried out by using various condensers of reasonably high accuracy—2 or 5 per cent—which happened to be on hand. With their aid, other condensers of equal value were selected and by using series and parallel combinations several calibration points were established on each range. It was found that the resistance arms were of sufficient accuracy to give a 10:1 agreement between the scales, so having satisfied oneself, for example, of the accuracy of the 500 pF point on scale 2, the positions for 50 pF on scale 1 and 5,000 pF on scale 3 were marked in.

A two-gang variable condenser may be used with advantage during calibrating. Most of the better designed components have good agreement in capacity between sections, and if this is found to be the case with the one available, placing the two sections of the gang in series and then in parallel will enable additional points at half and twice the capacity of one section to be established. With the aid of a twin-gang 25 pF per section condenser calibration of the low capacity end of scale 1 was carried out and it was found that the position for 5 pF on that range agreed perfectly with the previously marked points for 50 and 500 pF on scales 2 and 3 respectively, proving that stray capacities were not upsetting the calibration in any way.

Theoretically it would be possible to calibrate the bridge over its entire range with the aid of one 100 pF fixed and a two-gang 500 pF variable condenser, but it is of considerable assistance if a few other values of good accuracy are available for checking purposes.

It is frequently the lower values of capacity which are the least easy to determine and it is useful, therefore, to have a ready check at this end of the scale. It was thought that use could be made in this connection of the published data on valve capacities, but this is not generally practicable as the makers' figures are determined with a three-terminal bridge under certain conditions of circuitry and the figures are not always repeatable with a simple bridge such as the one described.

Well, I've shielded everything here but there's still a trace of hum . . .

However, tests on the well known Mullard EF50 (Z90, VR91, 10E/92, CV1091 or ARP35) which is to be found among most amateurs' stocks of valves, show good agreement with the published figures, namely, $C_{g1-k} = 8{\cdot}3$ pF, $C_{a-k} = 5{\cdot}2$ pF measured straight on to the valve pins (numbers 6 and 7, and 3 and 6 respectively). In addition it will be found that measurements between pins 2 and 7 show approximately 7 pF and between pins 3 and 7 a value of 5 pF.

Variations

It is, of course, perfectly practicable to use other capacities of condenser in the bridge, such as a three- or four-gang component with a capacity of 500 pF per section with a corresponding increase in the upper capacity limit of measurement. If the minimum capacity is higher, however, it may be difficult to measure capacities as low as 5 pF.

Again, the resistance arms may have other than a 10:1 relationship with consequent variation in the ranges of measurement. Finally, if a transistor a.f. oscillator were to be employed the instrument would not only be more compact, but would operate without the necessity for a mains supply. But the author's junk box doesn't contain any transistors—yet.

The Tri-Square Aerial

By H. H. GLOSTER (VE3IT)*

DURING the writer's career as an active amateur, from 1912 to the present date, many types of aerials have been built and tried; some good, some very poor indeed. The Yagi type, both two and three element, has always given good results, providing it is properly tuned and matched to the transmission line.

The Quad aerial appeared to present intriguing possibilities, and much thought was accordingly given to a suitable design with a view to comparing it with the two element close-spaced beam which had been in operation for approximately 18 months. The latter had given excellent results, and with a power input of 50 watts had resulted in 96 countries being worked. The article by G2PU in the March 1958 issue of the R.S.G.B. BULLETIN regarding the " Bi-Square " provided much valuable information. It was thought, however, that if two squares gave such good gain, three should increase it still further, although the little information available seemed to indicate that it was very doubtful if much additional gain could be expected from the use of an additional element. This, of course, presented an immediate challenge, so a tri-square aerial was built to resonate at approximately 100 Mc/s, since at this frequency the array was sufficiently small to lend itself to table-top experimentation. A gamma match to the driven element was used, since this provided a good impedance match irrespective of the number of elements used. A grid dip oscillator was used to drive the array, and measurements were taken by means of a field strength meter in the room. The following results were obtained:

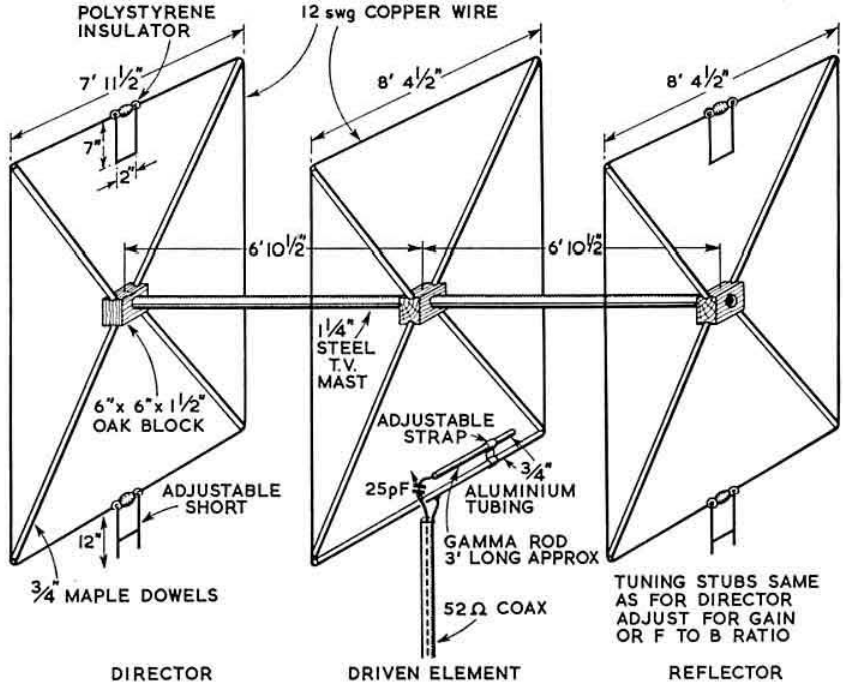


Fig. 1. Dimensions and mechanical details of a tri-square aerial for 28·25 Mc/s. The method of fixing the oak spider blocks is shown in Fig. 2.

Type of Aerial	F/S Meter Current Reading	Gain in db (Current)
Reference dipole	2 microamps	—
Square-driven element only	4 microamps	6
Square-driven element with reflector	7 microamps	10·8
Square-driven element with director	7 microamps	10·8
Tri-Square	15 microamps	17·5

In each case the gamma match was adjusted for correct impedance, and the stubs for maximum forward gain. These results were discounted to some extent, since it was felt that some of the gain might be attributed to the presence of metallic objects in the room: nevertheless it was felt that it would be decidedly worth while to proceed with the construction of a full size 28 Mc/s version. Fig. 1 shows the dimensions and mechanical details of the beam which resonates at 28·25 Mc/s. The method of holding the " spiders " to the boom is shown in Fig 2.

At VE3IT, the beam is supported at the approximate centre of the boom by a 1¼ in. steel TV mast. The aluminium tubing at the bottom of the driven element is lashed to the mast for mechanical strength, since this point is at zero r.f. potential. The top of the array is approximately 36 ft. above ground.

Impedance Matching

In securing the correct impedance match from the aerial to the transmission line the writer followed a practice which has always given excellent results. The distance from the transmitter output connector to the aerial feed point in its operating position is measured, and the coaxial cable cut to the exact multiple of an electrical half wavelength at the operating frequency, which is the same as, or greater than, the distance measured. The formula for an electrical half wavelength is:

$$\frac{492}{F(Mc/s)} \times Velocity\ Factor$$

For example, if the aerial is to resonate at 28·25 Mc/s the length of an electrical half-wave in feet would be

$$\frac{492}{28{\cdot}25} \times 0{\cdot}66 \text{ (for RG8/U cable)}.$$

This equals 11·52 ft. Hence, if the distance

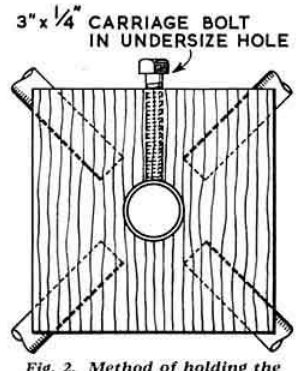


Fig. 2. Method of holding the " spiders " to the boom.

* *London Aeradio Station, Box 156, London, Ontario.*

from the transmitter were 50 ft. it would be necessary to make the feed line 57·6 ft. long, or five half-waves. The reason for making the cable an exact number of electrical half-waves long is that a transmission line "repeats itself" every half-wave, so if the line is terminated with a resistance at one end, the same resistance will appear at the other end. Under such conditions it is possible to erect the array in position, connect the feeder, and conduct all future measurements at the operating position, with the certainty that whatever changes appear at the feed point of the aerial, such changes will be repeated at the other end of the line. This is a most convenient arrangement since it permits the station owner to sit in comparative comfort in the operating room while passing instructions as to gamma match changes, etc., to the assistant on the roof or at the top of the mast!

Using an Antennascope (*CQ Magazine*, June and July issues, 1954) or some other form of bridge arrangement at the end of the coaxial inside the shack, the gamma rod length and capacitor setting is adjusted until a purely resistive load of 52 ohms (in this particular case) at the required operating frequency is secured. Then, with the aid of a field strength meter, the bottom stubs are adjusted for maximum forward gain, and the impedance match again checked and readjusted if required. It should be noted that the upper stubs are preset and are not touched during the tuning procedure. If maximum back-to-front ratio is desired then the help of a local amateur should be secured, the back of the beam turned towards his station while his carrier is on, and the stubs adjusted for minimum signal.

The gamma match capacitor should be enclosed in a suitable waterproof box (Fig. 3).

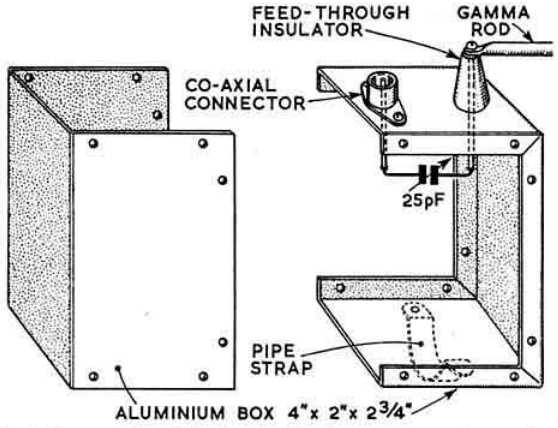


Fig. 3. Construction of the housing for the gamma match capacitor. After the impedance matching has been carried out, all joints should be covered with tape and the box sprayed with insulating varnish to make it waterproof.

Results

The prototype was completed in June 1958 and erected in position. Before dismantling the two element Yagi beam, however, a current reading was taken with the field strength meter at a distance of approximately 200 ft. With an input of 50 watts to the transmitter the field strength meter read 6 microamps. After erecting the tri-square, correctly matching the impedance to the 52 ohm RG8/U coaxial, and tuning for maximum forward gain, the current reading in the field strength meter in the same position as before was 26 microamps—a current gain of 12·7db.

During the summer the reports on short skip to W4 and W5 stations, and also along the southern path to South America, including Argentine and Chile, were excellent. When the band opened early in September to Europe and New Zealand the results were even more gratifying, reports of S9 to S9 plus being common. Consistently good reports have been received from G3HCU, G5HZ, G2BB, G3IGK and G2FSP. On many occasions when CQ has been called the writer has been delighted, if somewhat embarrassed, to find as many as three British stations calling him on the same frequency.

As VE3IT is located at the London (Ontario) Airport, transmitter output is limited to 50 watts, hence the input power is kept to 50 watts so that there is no fear of over-stepping the limit. Since this power is comparatively low the beam was tuned for maximum forward gain, with the result that the back-to-front ratio is not too good, but it is felt that there is no reason why it could not be tuned for maximum back-to-front ratio at some expense, of course, of forward gain.

Mention must be made of the splendid help given by VE3AGV in the mechanical considerations involved in getting the beam in operating position, and in assisting with the tuning.

"Modifying the Army W.S.19 for Amateur Bands Operation"

THE author (Mr. D. P. J. Mead, G3IDM) states that two errors occurred in the above article which appeared in the February issue of the R.S.G.B. BULLETIN. In Fig. 8 the grid of the second half of the 12AX7 should, of course, go to the slider of R6 and the input from the anode of the first half to the top of the potentiometer. In Fig. 9 the collector and emitter connections to the transistor should be reversed.

The Story of the Ionosphere

THIS new Hulton Educational Publication written by Dr. J. A. Harrison, tells in a non-mathematical way the fascinating story of the ionosphere. The early work of Hertz and Marconi leads up to an account of the achievements of Appleton. The use of radar, in war and peace is then dealt with, after which the principles of radio-astronomy are explained. Although primarily intended for use in the higher forms of secondary schools the book would not be out of place on the bookshelf of every radio amateur. It is interesting to note that Chapter 5 uses the same title as that of the highly successful film " Mirror in the Sky."

Profusely illustrated with many first class half-tone blocks and line diagrams *The Story of the Ionosphere* may be ordered through R.S.G.B. Headquarters, price 10s. 6d. (postage 9d.).

NORTH WESTERN REGIONAL MEETING

Imperial Hotel, Blackpool

Sunday, April 12, 1959

Programme :

Assemble	**12 noon**
Luncheon	**1.15 p.m.**
Business meeting	**2.45 p.m.**
Tea (followed by Draw for raffle)	**4.30 p.m.**

Tickets, (price 15/- each), are available from the Town Representative, H. G. Newland (G5ND), 161 Penrose Avenue, Marton, Blackpool. Last day for reservation April 10, 1959. The Council will be represented at the meeting by Messrs. W. J. Green (G3FBA), J. Douglas Kay (G3AAE), and the General Secretary (Mr. John Clarricoats, O.B.E., G6CL).

Voice Control for the Mercury

Simple Unit for A.M. Transmitters

By R. F. STEVENS (G2BVN)*

SPEECH controlled break-in operation (usually abbreviated to voice control or vox) has only come into use in amateur stations in recent years. Although the system finds greatest employment in connection with single sideband telephony transmissions (many readers will have been impressed by the conversational style of the contacts between stations using this type of emission) it can be equally well used with a.m. transmitters.

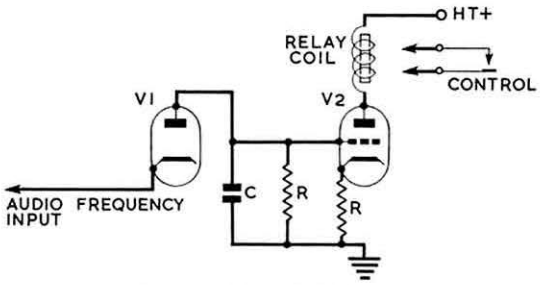


Fig. 1. Basic voice control circuit.

Amongst the advantages resulting from the use of voice control are (*i*) any interference is at once noted without having to wait until the end of the transmission, thus obviating the need for repetition; (*ii*) any question that is asked can be replied to immediately and the point is settled without delay or the need for notes; (*iii*) CQ calls are generally made with frequent pauses during which the answering station can break in with a short call.

The functions of the voice control unit are (*a*) to turn on the transmitter and mute the receiver when the microphone is energized, (*b*) to reverse these operations when the operator stops speaking. Additions to the basic unit can be made which will ensure that sound coming from the speaker does not cause the first function to take place.

Systems of Voice Control

There are two basic systems which can be utilized:

(*a*) Valve keyer control, generally of the blocked grid type, and

(*b*) Relay control, the coil of which is used as the anode load of a triode valve.

The electronic system has the advantages of being noiseless and instantaneous in operation, but requires the provision of a power supply where the negative output is above earth. At the present time the majority of voice control units in use appear to employ a quick acting relay having the required number of contacts, and the coil of which is of not less resistance than 10,000 ohms.

The principles of operation of nearly all relay controlled systems can be shown with the aid of Fig. 1. The audio frequency input is rectified by V1 and the resulting voltage is used to control the anode current of V2 and thus the operation of the relay. When the system is at rest V2 conducts and the relay is energized, but when the microphone is excited by the operator's voice the rectified

* *51 Pettits Lane, Romford, Essex.*

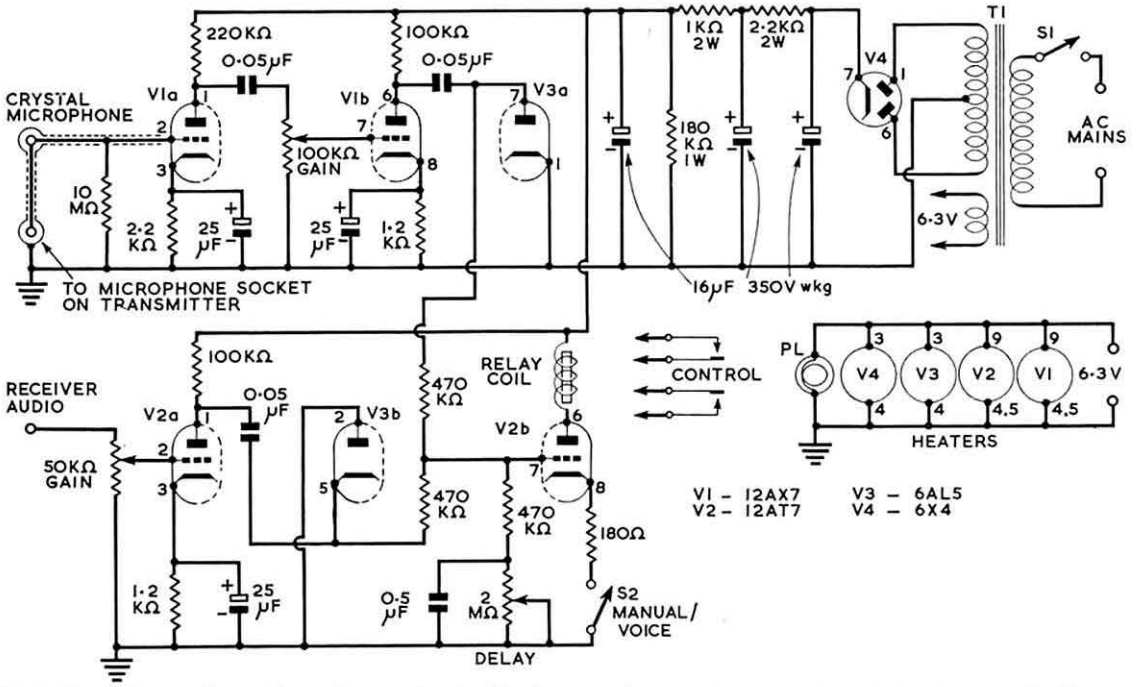


Fig. 2. Circuit diagram of a complete voice control unit. All resistors are ½ watt rating except where otherwise annotated. The mains transformer should have output voltages of 250-0-250 at 50 mA and 6.3 at 2 amps. The relay should have a coil resistance of at least 10,000 ohms. The 10 Megohm resistor in the grid circuit of V1a may be omitted if a grid resistor is already included in the transmitter speech amplifier.

negative voltage is sufficient to cut off the anode current of V2 and the relay is de-energized. The audio frequency input may be taken from the speech amplifier in the transmitter, or the voice control unit may incorporate its own audio amplification. In the latter case, the microphone output is connected to both the transmitter and the control unit. It is obviously undesirable that the transmitter should be turned off directly the operator stops speaking, and a resistance capacity arrangement is necessary so that a variable " hold in " delay may be obtained from the relay.

As stated previously, an addition to the basic unit can be made which will prevent the sound from the speaker triggering the voice control, but this feature will obviously be of little interest to the operator who habitually uses headphones. The circuit necessary to provide " anti-trip " facilities makes use of audio voltage from the receiver which is rectified and applied to the grid of the relay control valve in series with the output from the speech amplifier, but which is of opposite polarity. As sound from the speaker reaches the microphone it acts to turn on the transmitter but at the same time the audio frequency voltage obtained from the receiver acts in an opposite manner. After the two voltages have been balanced initially by means of the gain controls in the unit, the transmitter will not be turned on with normal output from the speaker. The audio voltage from the receiver may be obtained from the voice coil of the speaker or a 600 ohm tap on the output transformer.

A Practical Circuit

Fig. 2 shows the circuit of a unit which is used to control a Minimitter " Mercury " but is equally applicable to any similar commercial or home-built transmitter. In order to minimize the number of interconnecting leads, separate speech amplification and a self-contained power supply are used, but these are optional features according to the wishes of the individual operator.

Control of the Mercury transmitter is effected by switching the cathode circuits of the buffer and first doubler valves which are brought out to the keying jack. Additionally, control could be applied to a speech amplifier stage in the transmitter, and this would protect the modulation transformer. A further pair of contacts were originally used to energize the aerial change-over relay and to mute the receiver by shorting the voice coil leads to the speaker. However, an electronic transmit-receive switch has now been constructed and the aerial switching function is no longer required.

Control of the writer's s.s.b. transmitter is obtained by opening the cathode return of the balanced mixer valve, but in some cases it may be desired also to cut off the driver stage.

This operating aid offers the amateur a further field for experiment and design. Voice control can best be appreciated by taking part in a contact with another station similarly equipped.

Amateur Radio Mobile Society

MORE than 70 mobile enthusiasts attended the meeting called by Rex Toby (G2CDN) and held in London on February 22, 1959, when it was unanimously decided to set up a self-supporting society catering for the needs of amateur mobile operators. The committee elected to draw up a constitution and run the new society for its first year is as follows: F. J. Barns (G3AGP), G. A. Bird (G4ZU), S. A. Denney (G3CIM), V. A. W. Frisbee (G3KVF), F. C. Judd (G2BCX), J. A. Rouse (G2AHL), R. G. Shears (G8KW), G. E. Storey (G3HTC), A. W. Woolven (G3HLS) and E. W. Yeomanson (G3IIR). Until an Honorary Secretary has been appointed, those wishing to join the society are invited to write to R. G. Shears (G8KW), 136 Birchwood Road, Wilmington, Dartford, Kent.

Sir Raymund Hart is new Director of the Radio Industry Council

AIR Marshal Sir Raymund Hart, K.B.E., C.B., M.C., A.R.C.S., M.I.E.E., who was, until January 31, 1959, Controller of Engineering and Equipment at Air Ministry has been appointed Director of the Radio Industry Council in succession to Vice-Admiral J. W. S. Dorling, C.B., who retired in October last. Sir Raymund was one of the pioneers of radar before the war, and during the war he was responsible for the development of the operational use of radar on the ground and in the air. He was Chief Signals Officer, Allied Expeditionary Force during the planning and operational stages of the invasion of Europe.

Members will recall that Sir Raymund opened the R.S.G.B. Radio Hobbies Exhibition last November. He took up his new appointment on March 1.

I.E.E. Electronics and Communications Section

BY a decision of the Council of the Institution of Electrical Engineers the name of the Radio and Telecommunication Section of the Institution has been changed to " Electronics and Communications Section."

In recent years the word " electronics " has been broadly used to cover the evolution of new techniques in fields other than communication and, although the basis of this work may be attributable to those who have hitherto been regarded as engaged in the radio field, the final applications are often developed by other electrical engineers. The incorporation of the word " electronics " into the name of the Section is intended to emphasize that the Institution is the learned society for those properly qualified electrical engineers who regard themselves as " electronic " engineers.

The word " Radio " no longer appears in the title, because it is felt that this word, with its modern connotation of certain limited applications, is now insufficiently comprehensive.

So far as the omission of the word " telecommunication " is concerned, it is considered that the word " communications " will be interpreted broadly within the context of electrical engineering, and the change makes for a shorter and at the same time a more comprehensive title.

Radio and Electronic Components Show

TICKETS for the Radio Components Show to be held at Grosvenor House, Park Lane, London, W.1, and at Park Lane House, Park Lane, London, W.1, from Monday, April 6 to Thursday, April 9 (10 a.m. to 6 p.m. daily) may be obtained by sending a stamped and addressed envelope to the Secretary, R.E.C.M.F., 21 Tothill Street, London, S.W.1.

International Convention on Transistors and associated semiconductor devices

THE Rt. Hon. the Viscount Hailsham, Q.C., Lord President of the Council, has accepted an invitation to deliver the Opening Address at the International Convention on transistors and associated semiconductor devices which is to be held at Earl's Court during the period May 21-27, 1959.

D.A.R.C. Convention 1959

THE 1959 Convention of the German National Society (D.A.R.C.) will take place at Bad Harzburg, from May 8 to 10. Amateurs from other countries will be warmly welcomed. Bad Harzburg is located on the slopes of the Harz Mountains amidst beautiful German scenery.

All inquiries should be addressed to D.A.R.C.-Deutschland treffen 1959, Bad Harzburg, Postbox 189.

Modifications for Increased Drive from the Labgear Wideband Coupler

By C. T. STAGG (G3KPW)*

AFTER many hours' work involving four rebuilds of the transmitter and returning the wideband coupler unit to the manufacturers (who certainly altered and improved it), the drive to the p.a. stage was still much less than expected. As it was desired to use an 813 in the p.a., the alternatives seemed to be to use low power multipliers and a driver stage or to find some way of obtaining more drive from the v.f.o./coupler arrangement using 5763 valves. The physical layout of the transmitter prevented the use of a driver stage, so the circuit of the Labgear LG300 transmitter was studied.

A preliminary rewire enabled 20 mA drive to be obtained on 3·5 Mc/s, 22 mA on 7 Mc/s and 18 mA on 14 Mc/s—certainly a step in the right direction—but results were still very disappointing on 21 and 28 Mc/s. As the manufacturers had apparently decided against the use of wideband couplers in their own transmitters on these two bands, the unit was stripped and the following modifications carried out.

All the cover plates were first removed to allow easy access to the parts. Coils G4 and G5 were disconnected (Fig. 1). The green lead on each of these coils was then connected to a 100pF 1000 volt working capacitor, the other end of which was soldered to the blue lead of the remaining coil (anode of the previous valve). The trimming capacitors were removed and a tag strip put in the space previously occupied by them. On this strip a resistor and capacitor for the 21 Mc/s coil and an r.f. choke and capacitor for the 28 Mc/s coil were mounted. The r.f. choke comprised 80 turns of 30 s.w.g. wire wound on a 1 Megohm ½ watt resistor. A 0·001μF feed-through capacitor was soldered into the hole through which the h.t. feed originally came.

A 20 pF variable capacitor (Fig. 2) was fitted to the transmitter as near to the base of the 813 valve as possible and its control spindle brought out to the front panel.

* *3 Mayfield Villas, Moss Road, Askern, near Doncaster, Yorks.*

With the modifications complete a preliminary test was carried out with the covers off the coupling unit and the 20 pF capacitor set to minimum capacity. The 3·5, 7 and 14 Mc/s bands were aligned in the usual manner. The capacitor was then adjusted to half mesh and the slug in the 21 Mc/s coil set for maximum drive at 21·2 Mc/s. The 28 Mc/s coil was similarly adjusted at 28·3 Mc/s. These adjustments necessitated heating the wax on the coils with an iron and the use of a knitting needle which had been heated and bent at one

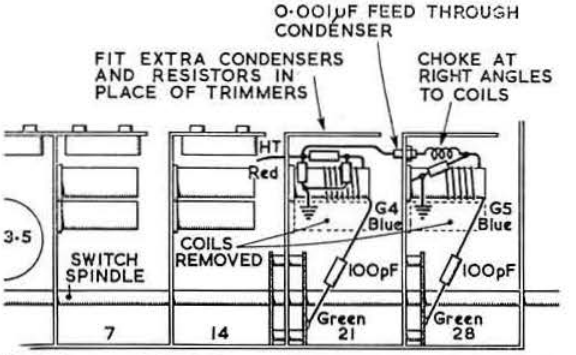


Fig. 1. Layout of the Labgear wideband coupler unit showing the position of the various components.

end—a tricky operation, particulary on the 21 Mc/s coil but justified by the results; drive is now 16 mA on 21 Mc/s and 18 mA on 28 Mc/s.

In spite of the increased drive, there is no apparent TVI problem. Incidentally, one 5763 valve can be saved by using an EL84 in the first stage of the unit, but the valveholder must be rewired.

D/F Qualifying Events 1959

THE Contests Committee will be pleased to hear from R.S.G.B. Groups and Affiliated Societies wishing to hold D/F Qualifying Events during 1959. A choice of alternative dates should be given if possible.

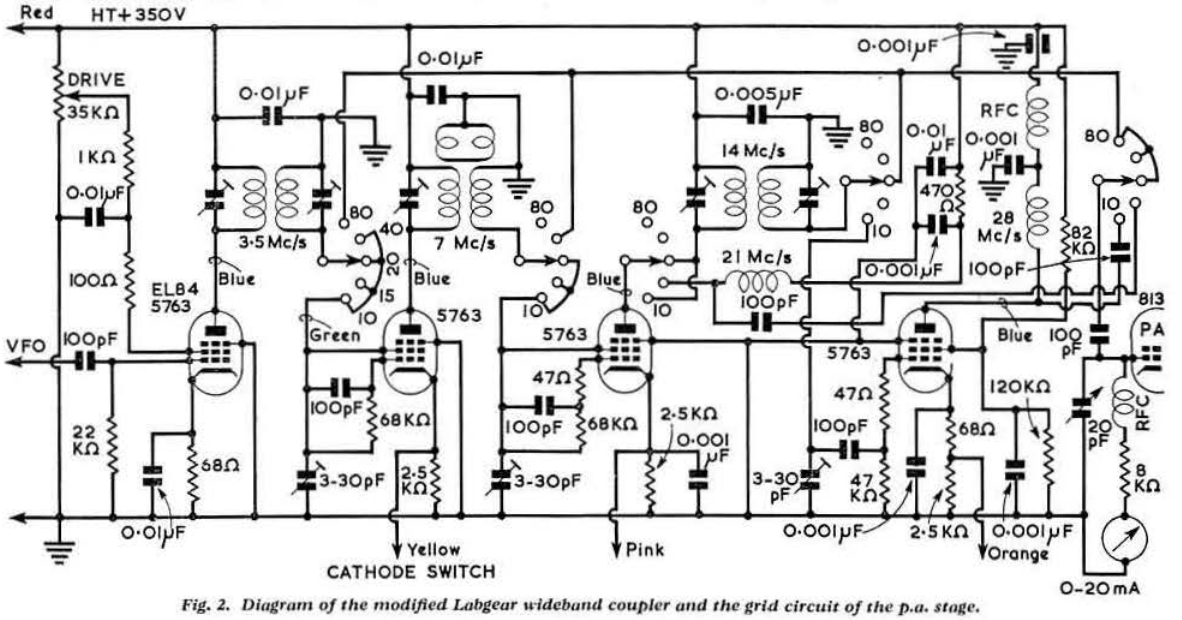


Fig. 2. Diagram of the modified Labgear wideband coupler and the grid circuit of the p.a. stage.

LICENCE QUIZ

By W. FARRAR, B.Sc. (G3ESP)*

HELPS YOU TO

Brush Up Your Regs!

ARE you proud of your station? Surely, otherwise you would set about improving it. Do you put out a good signal, without clicks, without splatter, with negligible harmonics? Well, you hope so. Do you observe strictly all the rules and regulations governing the operation and use of your station? Do you?

Prove your knowledge! Answer this quiz and afterwards (yes, *afterwards*) look at the answers on page 443 to see how many you have right.

Here are the questions:

1. When going on holiday, G3XYZ packs a small rig into his car, with a vibrator unit to run it from the car battery. It is only to be used when the car is stationary. How should he sign?
   (*a*) G3XYZ/A; (*b*) G3XYZ/M; (*c*) G3XYZ/P.
2. When operating away from home, the operator
   (*a*) Must have the appropriate licence with him; (*b*) Must have the current receipt for the licence fee; (*c*) Does not need to have any document with him.
3. When recording a transmission in the station log, you must put
   (*a*) The frequency band in use; (*b*) The approximate frequency; (*c*) The exact frequency $\pm 0{\cdot}01$ per cent.
4. What form must a log take?
   (*a*) A printed book endorsed: "Approved by the Postmaster General"; (*b*) A printed book not necessarily endorsed as in (*a*); (*c*) Any note book.
5. What class of person may operate your station?
   (*a*) Anybody, provided you are supervising; (*b*) Anyone who holds an Amateur Radio Certificate or transmitting licence issued by the P.M.G., provided you supervise him; (*c*) Any other licensed amateur, whether you are present or not.
6. During operation on bands where the signals are unlikely to be heard outside the United Kingdom it is only necessary to
   (*a*) Use the suffix letters of the call-sign allotted by the Post Office; (*b*) Use the figure and last two (or three) letters of the call-sign; (*c*) Use the full call-sign as stated in the station licence.
7. G3WWV is a schoolmaster whose home is in Lancashire, but who, during term time, is resident at a boarding school in Yorkshire, where he also has a station. How should he sign in Yorkshire?
   (*a*) G3WWV; (*b*) G3WWV/A; (*c*) G3WWV/Yorkshire.
8. G3ZZZ spends his fortnight's vacation cruising on the Norfolk Broads, and takes a rig with him. What is his holiday call-sign?
   (*a*) G3ZZZ/P; (*b*) G3ZZZ/M; (*c*) G3ZZZ/MM.
9. When operating mobile, portable or at a temporary alternative address, how often must the location be announced?
   (*a*) Every ten minutes or less; (*b*) At intervals of not more than 30 minutes; (*c*) One need not send the location at all.
10. On which of the following bands may amateurs *not* use frequency modulated signals?
    (*a*) 1·8 – 2 Mc/s; (*b*) 3·635 – 3·685 Mc/s; (*c*) 144 – 144·5 Mc/s.
11. By which of the following qualifications can one qualify (as regards technical knowledge) for an amateur transmitting licence?
    (*a*) One has passed the Radio Amateurs' Examination; (*b*) One has a university degree in Physics or Electrical Engineering; (*c*) One holds, or has recently held, an amateur transmitting licence in another Commonwealth country.
12. In an attempt to win the Top Band contest, an operator decides to use a full-wave wire held near vertical by a balloon. What is he doing wrong?
    (*a*) The maximum permitted length of any amateur transmitting aerial is 100 yards, so his wire is too long; (*b*) The height of any amateur transmitting aerial must not exceed 50 ft.; (*c*) One must not support an aerial wire from a balloon, because if the wire breaks loose and floats away it can be a danger to aircraft.
13. A British operator has a 'phone QSO with an amateur in Germany. The British operator
    (*a*) Must speak English; (*b*) May speak in German; (*c*) May use any language from Ethiopian to Esperanto to make himself understood.
14. Your station must close down at any time on demand from
    (*a*) An officer of the Post Office; (*b*) A uniformed police officer; (*c*) A military officer not lower in rank than Captain in the Army, or the equivalent rank of the Royal Navy or Royal Air Force.
15. An amateur in Liverpool must not operate in the band 70·2 – 70·4 Mc/s. Why?
    (*a*) Important dock radio services use channels in that region; (*b*) To avoid possible interference with the Liverpool police radio network; (*c*) Because he is within 50 miles of Jodrell Bank.

* *6 Hemsworth Road, Ackworth, Pontefract, Yorks.*

Top Band DX-Pedition Planned

MESSRS. D. G. Enoch (G3KLZ) and P. E. Gillett (G3MGA), are planning a Top Band DX-pedition during the coming summer and are willing to visit "rare" countries in either Wales or Scotland to give the "county chasers" a chance of working a new one. Interested readers are invited to write to G3KLZ, 86 Heaton Park Drive, Bradford, 9.

A Prayer from the Heart

I remember, I remember in the far off days of yore,
Sailing past Thameshaven and out toward The Nore
We had a little wooden box, a crystal 31 B
An A.T.I. and a rotary gap
And a ruddy big brass bound key.

The headphones were by Sullivan's,
Though my Senior he owned Browns.
The Manual was by Hawkhead
To guide our Ups and Downs.

The Q Code was a Q Code,
We used it to the full
QRS, QSZ and QRT
And all that sort of Bull.

Our range was in The Berne List
One hundred miles was plenty
But by shorting here and likewise there
We gained the extra twenty.

And now I own another box
With crystal, valve and key,
And I've become an amateur
Paying my two quid fee.
So please, oh! please, you phone chaps
Leave 50 kc/s FREE.

H. S. N.

New Developments in Radio Communications

TWO items of practical interest to members have recently appeared in the literature. One refers to an improved system of s.s.b., and the other to obtaining much more power output from class C p.a. stages.

The Philips engineers who were responsible for the Delta modulation system have now developed the "Frena" system [1]. This is so named because the audio *FRE*quency a*N*d *A*mplitude components are transmitted separately, being recombined at the receiver. By this means a system that is very insensitive to noise results. The operation is as follows: it has been observed that extreme clipping of an audio signal so that there is absolutely no amplitude variation still gives an intelligible signal, whereas leaving the amplitude component but removing the frequency component results in an unintelligible signal. Consequently, applying information theory techniques, it is not necessary to use as wide a bandwidth to transmit the amplitude variations as is required for the frequency variations.

One big problem with clipping is the harmonic content of the output. In the Frena system instead of clipping the audio, an s.s.b. signal at about 50 kc/s is clipped instead. The harmonics now appear at 100 kc/s and are easily filtered off. At the same time the unclipped s.s.b. is detected and this detected output is passed through a low pass filter with a bandwidth of say 100 c/s. This l.f. output signal now follows the original audio amplitude variations. At the receiver the s.s.b. signal, which now has additional amplitude variations due to noise, is clipped and mixed with the amplitude-channel signal before being demodulated in the usual way.

The real advantage of the system comes in the method of transmitting the amplitude signal. If this is done by normal a.m. of the carrier, there is an improvement of 2db over the simple s.s.b. case—or the transmitter power could be reduced by 37 per cent. This channel is itself susceptible to noise however, so there is an improvement in performance if f.m. is used—this time 4db. But 6db can be obtained if this amplitude signal is merely an on-off indication to show whether or not modulation is present in the frequency channel. Further this on-off signal can be the pilot carrier of the s.s.b. signal, electronically switched to be on when there is no modulation. (Naturally this method may not be practical in amateur use due to heterodyne problems). Under these conditions a signal is intelligible if the signal-to-noise ratio is 0db, i.e. noise power received = signal power received! Consider now that there is an improvement of 6db over the simple s.s.b. system for the same signal-to-noise ratio; add the 9db that s.s.b. already gives over a.m. and we are getting somewhere. Furthermore, since the transmitter is running at constant output, the p.a. can operate in class C instead of under less efficient linear conditions, so the p.a. efficiency can be increased! Combined with the improvements mentioned below, this raises some very interesting thoughts.

Improved Class C Efficiency

The second article [2] deals with improvements to p.a. stages themselves. Increasing the efficiency of a class C stage by increasing the bias and driving harder has the effect of narrowing the anode current pulse, and since the peak of this current is eventually limited by cathode emission the power output begins to decrease. An efficiency of about 70 per cent is usually obtained. However, by introducing some third harmonic into the drive waveform (and filtering it out again at the anode) a much broader pulse of current flows in the valve. This gives an increase of power between 40 and 400 per cent. For the Eimac 4-125A, rated at 375 watts output in the handbooks, over 1000 watts has been obtained in this way, at an efficiency of 90·4 per cent. As the harmonic circuits require tuning, the system will be of most use in fixed frequency transmitters such as v.h.f. or crystal controlled mobiles, where the increased power would be most welcome. If someone can now do the same thing with a transistor, maybe there will be no more need of 813s—or will the 813 owners have even more powerful signals?

References

[1] "The 'FRENA' System: A System of Speech Transmission at High Noise Levels," *Philips Technical Review*, Vol. 19 No. 3, October 1957.

[2] "A New High-Efficiency Power Amplifier," *Marconi Review*, Vol. XXI No. 130, Third Quarter 1958.

—M.B.

Some International Geophysical Year Achievements

THE Royal Society has published a booklet describing some of the achievements of the I.G.Y. The booklet gives a brief report on each of 15 scientific subject fields of the I.G.Y.

The President of the R.S.G.B., Dr. R. L. Smith-Rose, has been responsible for a most important part of the whole programme, that of World Days and Communications, and in this capacity he is a member of the British National Committee for the International Geophysical Year.

Of particular interest to radio amateurs are the sections devoted to World Days and Communications, Meteorology, Aurora and Airglow, Ionosphere, Solar Activity, Rockets and Satellites. The purpose of the period we know as "International Geophysical Co-operation 1959" is also stated.

The booklet, entitled *Some International Geophysical Year Achievements*, is available on request from The Royal Society, I.G.Y. Office, Burlington House, Piccadilly, London, W.1. We strongly recommend it not only to I.G.Y. observers but also to all those interested in scientific matters generally.

—G.M.C.S.

WEDDING BELLS IN BRIDLINGTON

Well-known personalities in the Bridlington area of East Yorkshire were present at the wedding recently of Shirley Dunn, daughter of G2ACD, to G3JBR. In this picture with the bride and bridegroom are from left to right: G3HKO, B.R.S. 21958, G3HFW, G2LR, G3DQ, G2ACD, G3GBH and G5GX.

FOUR METRES AND DOWN

BY F. G. LAMBETH (G2AIW) *

Good Opening on 144 Mc/s—New Two Metre Band Plan

AFTER a prolonged period of rather poor conditions, the 2m band really came to life during the evening of February 18 and at times was full of near European signals. Outstanding were PA0LQ, PA0FB, PA0MZ, PA0FA, PA0BM, PA0VHF, PA0ROX and PA0HRX, ON4BZ, ON4HN and ON4DY. Barometric pressure at the time was falling steadily although it remained high. Signal strengths were phenomenal—"just like a local" was a common report.

G3JR (Barnes) with a five element indoor quad (13db gain) worked PA0LQ, PA0BU, ON4BZ and ON4DY at good strengths. **G3HBW** had phone contacts with SM7BAE, SM7BOR and OZ9AC and with SM7AED and SM7YO on c.w. **PA0FB** worked two SM7s on c.w. and an OZ on phone. **G2CZS** (Chelmsford) worked SM7AED at RS59 and was then called by SM7BAE, OZ9NI, OZ8LM and OZ9AC in quick succession. **G3FAN** (I.o.W.) had a QSO with SM7BOR while **G3HAZ** (Birmingham) heard OK1VR/P (RST329) for the third time but again no contact resulted. PA0LQ was also logged.

G3FZL (Forest Hill) found February 17 good to the west and south-west and the 18th excellent for the east and north-east. OZ7IGY was heard on the 18th between 22.00 and 22.30 at signal strengths varying from RST539 to 559. SM6PU was worked. Stations worked on the two days included DL1FF, DL1RX, DL1YW, DL3YBA, DL6QS, DL6WUA, GW3MFY, ON4PE, ON4XT, OZ3NH (who was using s.s.b. and looking for British s.s.b. stations), PA0DT, SM7AED, SM7BAE and SM7PQ.

Changes in the Band Plan

Details of the revised British Isles Two Metre Band Plan are given elsewhere in this feature. It is sincerely hoped that all v.h.f. enthusiasts will co-operate in bringing the new arrangements into use quickly and so help to avoid the interference problems which have arisen in the past.

Parametric Amplifiers

Fired by the articles in *CQ* and *QST* and by G3HBW, G3COJ has been experimenting with parametric amplifiers for 144 Mc/s. So far, there have been promising results with the Mullard OA10 germanium junction diode, which will give a noise factor of 4db on 2m. The next step is to try an SX761 silicon diode designed for variable capacity work. Point contact diodes (GEX66, OA5, etc.) and silicon junction power rectifiers (e.g. RS24A, SJ301B) seem to be of little or no use. G3FZL is also working on a parametric amplifier.

A lecture on these amplifiers by a member of the Services Electronics Research Laboratory (Admiralty) has been arranged for the Fifth International V.H.F./U.H.F. Convention in London on May 30. At the same function Dr. Kaiser of Sheffield University will be giving another of his excellent lectures—this time on "Meteor Scatter Propagation."

V.H.F. Transistors

There is more news this month from the v.h.f. transistor front which it is hoped will stimulate other experimenters to action. F3SK, having had a mishap involving four broken ribs, was, due to the enforced rest, able to concentrate on this subject, in which he is a true pioneer. Accordingly, he began improving the performance, sensitivity, stability and signal-to-noise ratio of his portable all-transistor receiver. As it is essential for the v.h.f. part of this set to have an 18 volt power supply, and as the whole set was intended to run off a 6 volt storage battery, a tiny 18 volt transistorized d.c. converter was built with a pair of Philips (Mullard) OC72 transistors. This small convertor, giving 500 mW output, has an efficiency of 75 per cent after rectification, filtering and stabilizing. Next, a QRP 145 Mc/s all-transistor transmitter was built, the line-up of which is as follows: 2N384 overtone oscillator at 24 Mc/s with an 8 Mc/s FT243 crystal, 2N384 frequency trebler to 75 Mc/s, 2N384 doubler to 144 Mc/s and push-pull 2N384s in the p.a. at 144 Mc/s. The latter also requires an 18 volt supply giving about 180 mW. The note was not quite T9X but F8OL said it was a good T9. If the last two stages only are keyed, the note becomes T9X. Modulating the collectors of the last two stages with a small transistor amplifier gave very good results—phone signals were RS55 at F8OL (8 miles) and RS57 at F8OL/F9CH at 9 miles. The latter station is at the Design Laboratories of the French Army Signals. The location is good although the signals have to go through Paris and the sites are non-optical. The 2N384 is not very efficient above 100 Mc/s (it amplifies strongly at 70 Mc/s), and by courtesy of Gen. Revirieux (F8OL) experiments were therefore made with one of the Philco 2N504 micro-alloy diffused base transistors which are tested for 8db gain at 200 Mc/s. One of these, replacing the push-pull 2N384, gave greatly increased output and efficiency. F3SK thinks that contacts over 50 to 60 miles could be achieved. He feels it is even more interesting to work on receivers so the one displayed at last year's International V.H.F./U.H.F. Convention in London has been rebuilt. Replacing the 2N384 by a 2N502 in the mixer stage gave unchanged results, but in the v.h.f. amplifier considerable improvement was noticed, the noise factor improving from 13db to slightly below 9·5db. F3SK has promised to bring this "valveless" transmitting and receiving equipment to the Fifth Convention on May 30. All he needs is a 6 volt battery and a 144 Mc/s mobile station.

Scandinavian Frequencies

G3HAZ reports that the following frequencies are in use in Scandinavia by some of the best known v.h.f. stations: SM4BIU (144·60), SM5AY (144·33), SM5BDQ (144·81), SM5BRT (144·50), SM5VL (144·26), SM5SI (145·04), SM5ABA (144·90), SM6BTT (low end), SM6NQ (144·11), SM7AED (144·78), SM7BE (144·72), SM7BAE (144·78), SM7BZX (144·80), SM7ZN (144·65), SM7YO (144·88), SM7CPB (144·53), LA4VC (144·38), LA7TY (144·60), LA8RB (144·90), LA9T (144·27).

Malta on Two Metres

G2MI reports that ZB1AJ, ZB1BJ or ZB1E is active on 145·3 Mc/s from 08.00 to 09.00 G.M.T. every Sunday, beaming on the U.K. and looking for G contacts. They

* *21 Bridge Way, Whitton, Twickenham, Middlesex.*

would like to know whether the time chosen is the most suitable.

PE1PL Skeds

G2NY reports that with effect from February 1 PE1PL have, with one or two exceptions, cancelled all their v.h.f. schedules.

The 144 Mc/s C.W. Contest

Some operators are said not to have supported this contest because they object to the First 144 Mc/s Field Day on May 3 also being a c.w. only contest. It is also said that many portables will not be out on May 3. The writer cannot see the logic of this, and confesses to becoming a trifle weary of such small-minded criticisms. If people want to work phone in a v.h.f. contest, experience shows there is usually plenty of time to make a contest QSO on c.w. and then have a phone conversation if they wish. Let's have an end to these complaints and some sensible co-operation! In any case, the January contest was an additional one, laid on for the benefit of the many who wanted it; and the May event is c.w. only because we in the R.S.G.B. wish to conform with the decision taken at the meeting of Region I V.H.F. Managers in Bad Godesberg last year.

Two Metres

G2HDR (Stoke Bishop, Bristol 9) has had a quiet month, with little of interest. On February 15, conditions appeared quite good, but later fell off. On the 15th G3HBW was heard and called unsuccessfully on the key. When stations are heard from east of G2HDR things are usually pretty bright. There are two new stations active from Bristol—G6GN and G3CHW—both pillars of the local group and converts from the h.f. bands. It is hoped that their interest in v.h.f. will quicken the interest of other locals.

G3FKO (Bristol) also welcomes G6GN and G3CHW. Both have enviable sites for a drop away to the East and North! G3FKO is at present testing a "halo" in the roof space prior to mobile fitment, and the tests indicate good all-round coverage on low power.

G3AYC (B.B.C. Ariel Club, London, W.1) will shortly close down for a time as it is being moved from the second up to the seventh floor of the Langham Hotel.

G5DW (Ashcott, Bridgwater) found the January C.W. Contest very good during the short periods he was able to operate. January 27/8 were very good days for north/south signals while the 29th was good with severe fading on signals. By February 4 conditions were very poor indeed but February 8 (fortunately a Sunday) was exceptional with signals steady and strong from the North of England right down to F3LP at Le Havre who was a solid S9 most of the day. The week from February 10 onward was quite good, the night of the 15th being better than some operators in the north seemed to think—G5DW was hearing G3JZN (Manchester) having a local "natter" at a very good S8 with only slight fading.

G3HAZ (Birmingham 31) says that most of the stations worked recently have been locals, among them **G3KKB,** a blind member of M.A.R.S. who has been doing very well on the l.f. bands. He is putting out an excellent signal from Handsworth using about 50 watts to an 829B modulated by KT66s, and feeding a single slot indoors. **G3JXL** has opened up in Derby and puts out a fine signal. Conditions have been average or a little above, but nothing out of the ordinary except for a lonely PA0 rolling in on phone one evening, with hardly anyone to reply to him! No other Continentals whatever were then in evidence.

EI2W will be on 2m again from April 1 and hopes to work through most of the summer from the station at Sandyford, 2 miles from Foxrock.

G2XV (Cambridge) had a fine QSO with ON4BZ at S6/7 both ways on January 26.

(*Continued on page 442*)

British Isles Two Metre Band Plan—Changes in Zones and Frequencies

IN October 1949, a Plan for the better utilization of the 2m band, suggested some time earlier by Ian Paul (G3CYY) and E. J. Williams (G2XC) in the *Short Wave Magazine*, was introduced and soon adopted by many v.h.f. operators. The Plan divided the United Kingdom into zones, to each of which was allocated a certain sub-band of frequencies within the general limits 144 to 146 Mc/s, the object being to restrict the frequency range to be searched when the receiving aerial was pointed in any given direction and to facilitate contacts with DX stations by separating them from local stations.

In July 1953 a meeting took place at R.S.G.B. Headquarters between representatives of the *Short Wave Magazine*, *Wireless World*, *The Radio Amateur*, The Television Society, the British Amateur Television Club, the London U.H.F. Group and R.S.G.B. to consider the general adoption of the Plan in view of the increasing interest in 2m operation. It was unanimously agreed to continue the Plan in its existing form on, of course, a voluntary basis.

Ever since the 2m band was allocated to U.K. amateurs, frequencies between 144 and 145·5 Mc/s have been shared with the aeronautical services on a non-interference basis. Unfortunately, cases of interference between amateurs and aircraft have been reported to the Post Office by the Air Ministry from time to time, especially during the past year. As a result, a meeting was held in November 1958 between representatives of the Post Office, the Air Ministry and the R.S.G.B. (representing the Amateur Radio movement) to discuss the situation. From the Air Ministry's reports it appeared that the services affected operated between 144 and 144·9 Mc/s. The Post Office offered to make the allocation 145 to 146 Mc/s exclusively amateur—a gain of half a megacycle—provided changes were made in the 2m Band Plan to discourage the use of the lower half of the band in those parts of the country where it was considered interference between amateurs and aircraft would be most likely to occur. Although the discussions were carried out in the most amicable atmosphere it was very clear to the amateur representatives that drastic action would have to be taken to obviate, so far as possible, the continuance of the existing state of affairs.

In order to preserve the original intention of the Plan, while incorporating the changes necessary to meet the wishes of the authorities, a comprehensive reorganization of the frequency allocations between zones was found to be necessary. The new Plan, which has received the approval of both the Post Office and the Air Ministry, is shown opposite. While adhering to the broad Plan amateurs are asked to avoid operation on the following spot frequencies which are used by the aeronautical services for emergency purposes involving the safety of aircraft: 144·0 144·09, 144·18, 144·27, 144·36, 144·45, 144·54 144·63, 144·72, 144·81, 144·90 Mc/s. (Note: 144·99 Mc/s is not used.)

Inconvenience is bound to be experienced by some 2m operators but it is hoped that the crystal exchange services to be operated by the *R.S.G.B. Bulletin* and the *Short Wave Magazine* will go some way towards alleviating these difficulties.

Finally, the co-operation of all amateurs is invited in helping to make the new Plan as successful as the old.

BRITISH ISLES TWO METRE BAND PLAN

(Revised March 1959)

Zone	Mc/s	Area	Zone	Mc/s	Area
1	144.0 -144.1	Cornwall, Devonshire, Somerset.	6	145.1 -145.3	Cambridgeshire, Huntingdonshire, Leicestershire, Norfolk, Northamptonshire, Oxfordshire, Rutland, Suffolk, Warwickshire.
2	144.1 -144.25	Berkshire, Dorset, Hampshire, Wiltshire, Channel Islands.	7	145.3 -145.5	Anglesey, Caernarvonshire, Cheshire, Denbighshire, Flintshire, Merionethshire, Montgomeryshire, Shropshire, Staffordshire.
3	144.25-144.5	Brecknockshire, Cardiganshire, Carmarthenshire, Glamorgan, Gloucestershire, Herefordshire, Monmouthshire, Pembrokeshire, Radnorshire, Worcestershire.	8	145.5 -145.8	Derbyshire, Lancashire, Lincolnshire, Nottinghamshire, Yorkshire.
4	144.5 -144.7	Kent, Surrey and Sussex.	9	145.8 -146	All Scotland, Northern Ireland, Isle of Man, Cumberland, Co. Durham, Northumberland, Westmorland.
5	144.7 -145.1	Bedfordshire, Buckinghamshire, Essex, Hertfordshire, London, Middlesex.			

A.1491 (Palmers Green) found January 29 (three Derbyshire stations and F3LP), February 8 (Cambridge stations, Northants for a new county and G5DW, Somerset) and February 16 (G3BVU, Oxon., and G3LOK, I.o.W.) the outstanding dates. G3LAR (Streatham) is another new station heard on 2m.

G3JGJ (Paignton) says conditions were very poor up to February 15. GC2FZC was worked on sked several times between January 28 and February 16 with strengths ranging from S9+ to very weak indeed, and rising towards the end of the period to S9+ again. A bright spot was an opening in the Sussex direction on February 15, when the barometer was at 1038 mb. G2RY was worked every evening between 18.00 and 18.30 G.M.T. almost 100 per cent. G3JGJ adds his voice to many others in deploring the possible loss of "worked and heard " lists. (The answer to this is that they must *not* get too unwieldy and must avoid locals or near-locals—G2AIW.)

G5MR (Hythe, Kent) greatly enjoyed the C.W. Contest on January 24 and hopes there will be more of them. It was a pleasant change to hear lots of readable c.w. signals on the band, instead of faint carriers; also conditions were fairly good. There was an opening on the evening of February 6 when ON4BZ was coming in at S9 on the back of the beam, and stations around London and the Home Counties were much stronger than usual. Activity seemed rather low, however.

B.R.S. 20133 (Melton Mowbray) heard F3LP on February 17 and says this is his " log." However there was quite a lot of G station activity also which made interesting listening. By the way, F3LP's frequency is now 145·19 Mc/s and apart from PE1PL, is certainly the strongest signal received from the Continent by B.R.S. 20133.

G3MED (nr. Northwich) has not been so active recently due to s.s.b. experiments on 80m. However, recently G3CCH (Scunthorpe) has been worked several times on 2m s.s.b. This is possibly the first two way s.s.b. on 2m in England. The distance is 78 miles and the reports were S9+ under all conditions. There are now several stations interested in s.s.b. on this band. If anyone hears an unreadable noise, try the b.f.o. and see what happens! G3MED found the C.W. Contest in January not well supported. Conditions were fair but there appeared to be few stations on. F3LP was worked on February 17 at S8/9 but no other EDX was heard.

Wales

GW2HIY (Holyhead) worked G3MED, G5YV, G3FZL and G3CCH in the January C.W. Contest. G3HBW was heard, and called at least a dozen times between 20.30/23.00 G.M.T. with no result. These were the only stations heard in 4½ hours operating, apart from three unidentifiable (phone) carriers. The contest, all in all, was disappointing. Conditions appeared right, but activity was small, and those who *were* on do not appear to have turned their beams towards Anglesey! GW2HIY thinks that half the potential operators have to go to work on Saturdays and hopes, for a single day contest, that a Sunday will be chosen in the future. The line up at GW2HIY is 40 watts to an 832 (a new transmitter with an 829B will soon be in use). Aerials available are a 6-over-6 slot and a 3 slot stack with reflectors. His operating times are 12.00 to 13.00 on Sundays and after 22.30 most evenings.

GW3MFY (Bridgend) has had the rare experience again (for a Welsh station) of a Continental opening. This was on February 17/18 when F3ND (Rouen), F9XG (Le Havre), and F9JY (Cherbourg) were worked with F8GH and F3AL as " near misses". Also worked for the first time were G3LAR (S.W. London), G6NF (Croydon), G5OC (Southampton) and G3EFT (nr. Brighton). The opening had been building up for some days, with conditions gradually improving all the time. ON4XT was heard and called (" if only they would use c.w." says GW3MFY). February 8 also deserves mention since F3LP was worked twice on phone as also were several stations in the Home Counties. The C.W. Contest was much appreciated although it was hard work to scrape 14 QSOs.

Scotland

All will be very sorry to hear that **GM6WL** (Jock Kyle), who has always been a faithful correspondent of this column, has been in Glasgow Western Infirmary for an abdominal operation. We all wish him a speedy recovery. This news came from both **GM3INK** and **GM2FHH** (Aberdeen) who reports on the aurora of January 25 when GM6SR, GM4HR, GM3LAV, G2JF, G3CCH, G3MED, DL3YBA and an OZ7 were heard. G5YV was worked at RST570, GM2FHH being RST560. The aurora was first noticed at 18.15 G.M.T. and faded out at approximately 19.25 G.M.T. Otherwise there was very little activity. GM2FHH reports that GM6IZ will be active this year on 2m and that SM6-2917 who reports through GM2FHH for the I.G.C. 1959 is now SM6PU.

Norway

LA9T (near Oslo) says January 25 turned out to be a " glorious aurora day " for LA3AA, LA4VC, LA8KB and LA9T. The following were heard and worked on 2m: SM5ABA, SM5BDQ, SM5SI, SM6NQ, SM6PU, SM7AED, SM6YO, SM6ZN, SM4PQ and DL3YBA. On January 28 atmospheric pressure went up to 1028mb and went down again, with fog, to 1024mb. As a result OZ stations suddenly came in at S9 and LA3AA, LA4VC, LA8EA and LA9T worked OZ2EM, OZ3NH, OZ3LE, OZ5OV, OZ6PB and SM6ANR. On January 29 LA8KB worked (tropo) SM5BDQ, SM4NK and others.

Four Metres

G5MR (Hythe, Kent) found conditions excellent around February 17. With the barometer at 1037mb and humidity 90° in still, foggy weather, French stations were well received and worked, including F9CZ (205 miles) S8 phone (he gave G5MR S9). F9CZ made a recording of G5MR's transmission and played it back. F9ND (V.H.F. Manager, R.E.F.) was worked on c.w. for the first time on 4m. Another new one heard was F3PW but no contact was possible as his converter is not yet modified to cover the G band. G5MR finds that reception of French f.m. broadcasting stations (87·5-100 Mc/s) is a good indication of conditions on 4m.

Dutch amateurs are to be allowed to continue using 70·3/70·4 Mc/s during 1959.

B.R.S.20133 is now equipped with an r.f. unit which should give 4m, but it needs some re-trimming, having apparently been tampered with. Knowing B.R.S.20133, we are confident the 4m reports will soon be forthcoming!

Six Metres

B.R.S. 21476 (Penarth) says that after a lull of several weeks, 50 Mc/s opened to U.S.A. on January 31 and during the afternoon of February 1. W1HDQ was heard to say in a

V.H.F. QSY

Following the re-arrangement of the British Isles Two Metre Zone Plan announced in this issue, members who wish to acquire crystals for their new zones or have crystals for disposal on an exchange basis, are invited to send details for inclusion in this space. Requests should be addressed to " V.H.F. QSY," R.S.G.B. BULLETIN.

QSO that over there the band was in its best shape for many weeks—which tallied with observations on this side. However, the opening was short-lived. On February 4 very strong European video signals were coming in on 49·75 Mc/s between 15.30 and 16.30 G.M.T., presumably of East European origin. The signals heard on February 1 were very strong, mostly RS59, as is usually the case when working near the m.u.f.; all were affected by the rapid fade that sometimes makes it difficult to get the correct call. It is interesting that VE1II and VE1IK were in QSO with each other when heard, and were apparently unaware of the DX opening!

B.R.S. 21476 refers to G2NR's comments (January issue). He has had correspondence and lists exchanged which prove G2NR's point, as many stations appear in one list and not the other (November 16) and similar results were noted over November 25/30. It might be interesting to enlarge on this and B.R.S. 21476 would like to exchange logs for November 16 with other listeners, when some interesting facts might emerge.

EI2W has finished 50 Mc/s work for the season. This year 37 states of U.S.A. (including a first-ever 50 Mc/s contact with California) were worked. The first Europe-Mexico contact was also made. At the end of the period signals were still "terrific." EI2W says that unless the SMs have exceeded 37 states, he should be well up in the *QST* 50 Mc/s table. Altogether EI2W has worked 305 Ws, 21 VE1/3s, one VO and one XE for a total of 328 different trans-Atlantic stations. The maximum power input was 40 watts.

LA9T (near Oslo) did not have such a good season and the openings were few and short. On January 18 VE1IK and VE1ZR were heard and VE1HT worked, while on January 31 LA9T heard W4RMU, W2IDZ, W3ASD, W2ZMH, W2HPN, VO1AU and some Southern American stations (short bursts only). February 1 brought further bursts from South American stations.

B.R.S. 20133 says the band opened on February 1 for short bursts of half a minute or so, and W1GKE, W1HOY and W1FCZ were logged during the afternoon.

Seventy Centimetres

G3HAZ (Birmingham) says that the Sunday morning 70cm round-up is still going strong and that he is still managing to pull in a few signals on his bi-directional (or is it omni-directional) long Yagi. At present, time is being spent to build a 70cm transmitter for one of the enthusiasts in the M.A.R.S. TV Group.

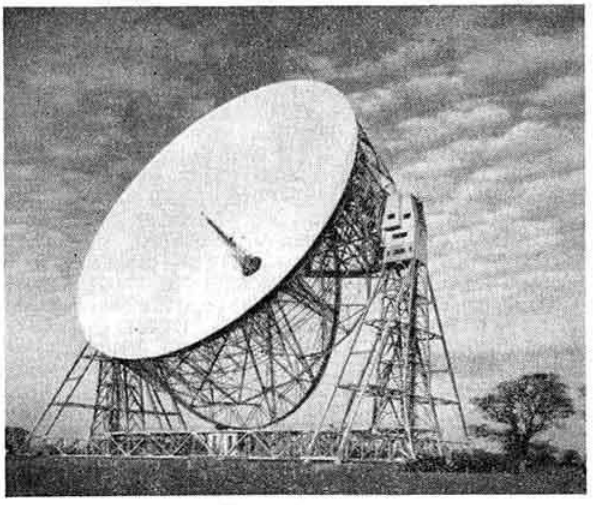
For **G2XV** (Cambridge) 70cm produced some interesting results on February 7; G5DT, G2FCA and G2HOJ were all good phone QSOs. F3LP was also heard in QSO with G stations and was getting into Cambridge at S7! During the evening of February 18 G2HDJ (Ashford, Middx.) worked PA0WAR on this band, but although conditions appeared excellent, little else was audible.

Twenty-four Centimetres across the Channel

F3SK is hoping to carry out 24cm tests with G stations during the summer. Working with F8MX from the block-house site (St. Valéry-en-Caux) he hopes to work British stations across the Channel. Anyone on or near the South Coast who is interested please communicate with either F3SK or G2AIW.

U.S. Moon Probe

PIONEER IV, the U.S. moon probe launched on March 3, carried a battery-operated transmitter designed to operate on 960·05 Mc/s for about 90 hours. The instrument is a conical gold-plated fibreglass package 20 in. long, 9 in. in diameter and weighing 13·4 lb. Its purpose is to probe the two so-called Van Allen radiation belts that surround the Earth, try to determine the extent of radiation in the vicinity of the Moon, and test the photo-electric sensory apparatus with which it is equipped.



This picture from the film "The Inquisitive Giant" shows the radio telescope at Jodrell Bank. The telescope is constructed of steel and weighs 2,000 tons, revolving on bogies of unusual construction running on rails laid in a circle with a diameter of 360 feet. The reflector bowl itself weighs 750 tons and rotates on two great trunions.
(Crown Copyright Reserved.)

Brush Up Your Regs!
Answers to the Quiz on page 437

1. Officially (*a*). But the G.P.O. does not object if you use /P for portable operation. **2.** (*a*). Clause 10 of the Amateur (Sound) Licence states: "The Station, *Licence*, and Log *shall be available for inspection* . . . by duly authorized officers of the Post Office." **3.** (*b*). **4.** (*a*), (*b*) or (*c*), provided it is not a loose-leaf type. **5.** (*b*). If your answer is (*c*) you can't count it. The licensee *must* be present. **6.** (*c*). The Amateur (Sound) Licence is quite specific on this point and states that no abbreviated form of the call-sign may be used at any time. **7.** (*a*). The address is not temporary (period exceeds 4 weeks) so he uses his normal call, having informed the Telephone Manager in the area in which his school is situated. **8.** (*b*). **9.** (*b*). **10.** (*c*). **11** (*a*). No exemptions are allowed now. **12.** (*c*). **13.** (*b*) or (*c*). " . . . messages in plain language . . ." (without qualification). **14.** (*a*). **15.** (*c*).

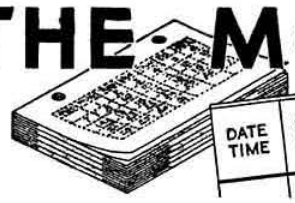
Rating

15 correct: If you ever find yourself in court, you won't need legal aid!
12 – 14: Very good. You are entitled to lay down the law on 80m 'phone!
9 – 11: So-so.
5 – 8: Better get the licence out of moth-balls and read it.
4 and under: Give up radio and collect soap coupons instead.

EDITORIAL NOTE: *Apropos question 11. It is understood that the P.M.G. is prepared to grant an Amateur (Sound) Licence to any person who has recently held an amateur transmitting licence in another Commonwealth country, provided the examination standard adopted by the particular administration is equal to, or better than, the U.K. standard.*

LONDON U.H.F. GROUP
will meet at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road,
at 7.30 p.m. on Thursday, April 2, 1959
All v.h.f. and u.h.f. enthusiasts welcome.

THE MONTH ON THE AIR



By J. DOUGLAS KAY (G3AAE)

Due to a sudden attack of influenza, Mr. S. A. Herbert (G3ATU) was unable to contribute *The Month on the Air* feature for this issue. This is the first occasion Mr. Herbert has been prevented from making a contribution since taking over from G2MI in December 1953.

Copy for the April issue should reach Mr. Herbert at Roker House, St. George's Terrace, Roker, Sunderland, not later than March 18, 1959.

IS it possible to produce a *Month on the Air* column within 24 hours starting absolutely from scratch? That was the problem that faced the writer, when he was informed that your regular commentator, Stan Herbert, was down with influenza and had not been able to pass on any of the reports he had received. Remembering the old gag "the impossible is done immediately—miracles take a little longer," it was decided that some effort must be made to inject a little DX news into the March BULLETIN. The following report has been compiled, thanks to the wonderful support of **G3YF, G6ZO, G8KS, G3AIZ, G3GMY** and **G3KRC**, all of whom kindly agreed to pass extracts from their logs over the telephone. All times are G.M.T.

Conditions on the l.f. bands have improved a little of late, but no reports have been received of outstanding DX worked on 3·5 Mc/s.

On 7 Mc/s conditions have often been better than on the three higher frequency bands especially between midnight and dawn. In this part of the spectrum, where the dipole and Zepp specialists come into their own, the following have been worked: HZ1HZ ('022, 00.25), UD6FA ('028, 01.20), UF6AA ('034, 02.15), ZD2GUP ('030, 02.15), PY4AXN ('005, 00.10), YV5ES ('002, 00.30) and ZD7SA ('006, 04.00), all on c.w., while several Gs are known to be working all over the U.S.A. on phone between 07.00 and 09.00.

EA8BC, Laguna, Teneriffe, who regularly distributes Canary Island QSOs on all bands from 3·5 to 28 Mc/s. Pepe is always good for a quick QSL.

Twenty Metres

The writer could have sworn that 14 Mc/s had been very sub-standard during the past month, but it must be that he needs a new receiver for there is nothing wrong with a band that can produce the following in a 28-day month: VU2SL ('068, 18.30), VP2SW ('075, 22.40), LX1RA ('038, 11.25) (this is genuine and his QSL has already been received), CE0ZA ('030, 23.05) (Luis is getting his cards out very quickly: he made 3,500 QSOs before leaving Juan Fernandez on February 16), UA0KZA ('040, 08.50) (who is situated just across the Bering Straits from KL7, and must surely be the only Russian station situated west of G), SM5WN/LA/P (Svalbard) ('022, 08.40), 9M2DW ('048, 23.45), VS9OM ('050, 23.50), AP5B ('090, 18.30) (our old friend Dave Boffin, G3HS, back in Pakistan again after nearly a decade), FB8CJ (ex-FK8AO, FQ8AE) ('320, 18.00), while FO8AB, FO8AG, FO8AK, FO8AO and FO8AU all operate above '300 in the early mornings. FB8XX and FB8ZZ are regularly on between 16.00 and 18.00, VQ8AQ ('020, '040 and '080 around 17.30), VS9MA, VS9MB and VS9MI (on '015 and '045 between 17.00 and 20.00). FU8AK ('008, 08.00) (QSL to VK6MK), FU8AE ('320, 08.00). FF8SC (permanently in the Republic of Guinea) '010 (T7), FG7XC ('005, 22.00), FG7XE ('005 and '040, 20.00/23.00), FY7YI ('040 and '080, 21.00), FY7YF ('008, 22.00), FM7WP and FM7WU (using v.f.o.s around 22.00), HR3EXP ('005, 23.00), ZL3VB (Chatham Is.) ('030, 07.00), BV1US ('040, 20.00), BV1USB ('012, 14.00), VK9AD ('020, 08.00), VK0RH (Wilkes Land) ('007, 17.30), KM6BK ('005 and '015), KM6BL ('035) and KM6BI ('030) all around 08.00, DU9AC ('015, 14.30), DU6IV (old KA6FA) ('022), KX6AF ('005, 21.30), KX6BP ('050, 08.00), KW6CQ ('023, 19.00), VR6TC ('060, 06.00/07.00), FD8DZ ('320) (s.s.b. and c.w.), VP8BK (South Georgia) ('014), CR5AC ('015, 19.00), XW8AI ('010, 17.00), ZK1AK ('040, 08.00), while ZS7M and ZS9M and ZS9N (a husband-and-wife team) are active with v.f.o.s. KC6JC (East Carolines) ('049, 10.00), CR9AH ('035, 14.30), VK0CC (Macquarrie) ('080, 11.35), KC6SP (West Carolines) ('075, 13.45), YJ1DL ('095, 11.30), VP2KR ('050, 22.00), W4JRD/KS4 ('020, 19.50), VP8EP ('030, 01.30) have all been worked while CR10AA was being called by a JA on '020 at 15.45. On phone SV0WB (Rhodes) ('118, 23.15), MP4DAS ('124, 15.00), HH2W ('073, 02.00), are worth noting while KC4USH on s.s.b. on '290 comes through well nearly every morning around 07.00/08.00.

Fifteen Metres

On 21 Mc/s c.w. SV0WAE (Rhodes) ('120, 08.44), CR5AR

(San Tomé) ('080, 21.00), 15AAW ('075, 18.45), FB8BX (Nossi Be), FB8XX (11.00/13.00 and 16.00/18.00), PY7SC (Fernando de Noronha Is.), BV1USB ('040, 13.00), DU6IV ('045, 09.00 LP, 13.00 SP), VP8EP (Halley Bay) ('020, 21.00/22.00), VP8CV (Falklands, 21.00), VP8DT (S. Orkneys), ZL5AC ('040) are active. On phone ZD1FG ('235, 08.20), VP2DA ('245, 23.15), VP2AB ('235, 22.00), VP2DJ ('235, 21.45), VP2DX ('210, 00.00), VP2KG ('258, 22.30) and VP5AK ('237, 22.00) are all available.

Ten Metres

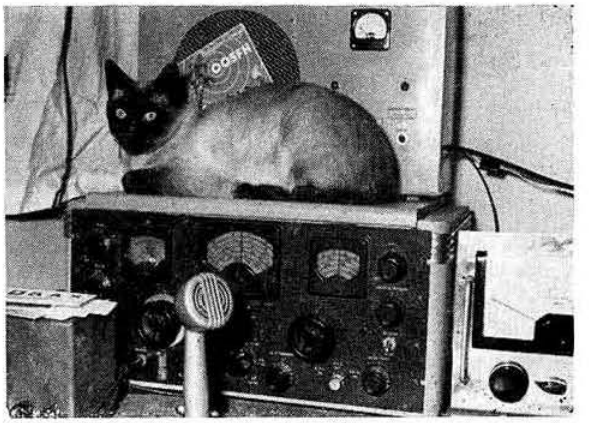
On 28 Mc/s c.w. UI8AG (11.40) and UD6AK (11.00) have been heard but otherwise very little until the W/K gang take over shortly before midday. On phone we find FM7WU ('400, 18.00), PJ2AQ ('210, 13.30), VK9SB (Papua) ('200, 11.30), VE1ACP (Prince Edward Is.) (15.00), VP2AB ('280, 19.30), VP8DW (son of VP8DS), and sundry African and South, Central and North American stations.

There seems to be little doubt from the above reports that 28 Mc/s is well below average at present. and that 14 Mc/s still contains all the plums, provided the short-skip interference will allow the weaker signals to percolate through.

Forthcoming Attractions

With regard to forthcoming attractions, a number of DX-peditions are slated to occur in the near future. March should see the start of that marathon **OK7 DX-pedition,** scheduled to last five years, when the two Collins KWM-1 stations should be operating from **ZA. UA0OM** is also scheduled to be operating from Tannu Tuva starting on March 19. The San Diego Club's DX-pedition to **Revilla Gigedo Is.** (Socorro) (**XE4**) should also see the light of day this month, while **XE1CV** and **XE1YJ** are planning a trip to the same island in June. Their transmitter will run 50 watts input on a.m. and c.w. on 7, 14, 21 and 28 Mc/s. A trap dipole will be used and possibly a 28 Mc/s beam.

A really desirable three-country DX-pedition is planned for May when **VR5AC** (Tonga), **ZK2AC** (Niue) and **ZM6AC** (Samoa) will each be activated for a few days—this will really set the beams oscillating between the long and short paths.



The station cat at ZE6JY waiting for those HSIs to come through!

HB1PV/VS will be operating on 3·5 to 28 Mc/s from Valais Canton during the Helvetia 22 Contest on April 4-5.

Overseas News

ZC3AC now signs VK9XM, while the other Christmas Is. enthusiast holds the call-sign VK9XN. The **Sultanate of Oman** is certainly making itself felt at present, thanks to the efforts of VS9AS as VS9OM and ZB2A operators signing ZB2A/VS9: their 8 watts puts a very healthy signal all round the world around midnight. There seems to be a hold up on **PY0NA** QSLs, but the EA gang recently received a batch from Flavio (PY1CK) who states that everyone deserving cards will receive them in the near future. On **St. Helena** ZD7SA and ZD7SE still hold forth while ZD7SF has returned to the U.K., as has also ZD8JP.

Rumour has it that *Yasme II*, which struck a reef north of Grenada, is not a total wreck, but is having a rather large hole repaired, and that Danny will shortly be joined

Frequency Predictions for April 1959

PREPARED BY J. DOUGLAS KAY (G3AAE)

BAND	NORTH AMERICA East Coast	NORTH AMERICA West Coast	CENTRAL AMERICA	SOUTH AMERICA	SOUTH AFRICA	NEAR EAST	MIDDLE EAST	FAR EAST	AUSTRALIA
M.U.F.	24 Mc/s 2000	20 Mc/s 2000	32 Mc/s 1630	36 Mc/s 1300	39 Mc/s 1200	35·5 Mc/s 1130	35 Mc/s 1000	30·5 Mc/s 1130	32 Mc/s 1000 SP
28 Mc/s	2000	2000	1030/2100	1000/2200	0700/2100	0700/1800	0800/1730	0930/1430	0800/1200 SP
21 Mc/s	1230/2200	2000	0800/0200	0815/1130 1800/0500	0530/0830 1300/0200	0500/2230	0600/2100	0630/1900	0630/1700 SP 0700/1000 LP 2000/0230 LP
14 Mc/s	2100/0900	0600/0900	2130/0900	2200/0830	1730/0500	1400/0900	1530/0300	1630/2200	1430/2200 SP
7 Mc/s	0000/0400	0600	0200	0400	0000	2030/0300	2200	2000	1600 SP
3·5 Mc/s	0200	0600	0200	0400	0000	0000	2200	2000	1600 SP

These predictions are based on information provided by the Engineer-in-Chief of the Post Office. All times are G.M.T.

by ZL1AV, who will operate with him during his forthcoming sally round the islands of the Pacific.

ST2AR applied for his annual licence renewal, but the issuing authorities have refused permission: meanwhile Eric keeps his fingers tightly crossed hoping that this is only a temporary hold up.

Members who have worked **HV1CN** but not yet received a QSL are asked to send him a further card via the R.S.G.B. QSL Bureau. It is thought some cards may have gone astray in the past.

VE8TO (ex-GM3HLD) is anxious to obtain his W.A.G.M. certificate before leaving Baffin Island and asks all those concerned to QSL him direct, c/o Federal Electric, Montreal, P.Q., Canada.

* * *

Well, there we are: no individual reports this month, but a great deal of information compiled at break-neck speed. In wishing G3ATU a speedy recovery may the writer take this opportunity of appealing to all readers of this column to give it greater support in the future. Whether you be striving to reach your first 100 countries or only one short of your 290 sticker you must have worked or heard something of interest on the DX bands during the past month. Contributors to this column are not trying to cover themselves with glory: on the contrary, they are supporting the feature that interests them most in the official journal of their own Society.

The closing date for the April issue is March 18. Good hunting and the best of DX to you all.

PACC Contest 1959

RADIO amateurs throughout the world are invited to take part in the 1959 PACC Contest organized by the Dutch national society V.E.R.O.N. The contest will take place on April 25 and 26 (C.W. Section) and May 2 and 3 (Phone Section), starting at 12.00 G.M.T. on the Saturday and ending at 23.59 G.M.T. on the Sunday in each case.

Entries must be posted not later than June 15 to P.v.d. Berg, Contest Manager, V.E.R.O.N., Keizerstraat 54, Gouda, Holland, from whom a copy of the rules may be obtained.

Coronation Safari

COMMUNICATIONS for the Coronation Safari to be held on March 27-30 inclusive will again be provided by members of the Radio Society of East Africa. The 3.5 and 7 Mc/s bands will be used. A description of the work done by amateurs in connection with the 1958 Safari appeared in the December issue of the R.S.G.B. BULLETIN.

Still they come!

UNION Congolaise des Amateurs de Radio (U.C.A.R.) announce that a certificate to be known as the Diplôme du Congo Belge et du Ruandi-Urundi (D.C.B.R.U.) will be issued to those who have contacted 20 different Amateur Radio stations in the various provinces of Belgian Congo and Ruandi-Urundi.

Full details of the rules governing the issue of this certificate can be obtained from the Secretary, U.C.A.R., P.O. Box 1104, Elizabethville, Belgian Congo.

The Niagara Frontier DX Association recently announced that the first award for "Outstanding performance in the art of amateur DXing" was issued in January, 1959. Issued monthly to the amateur or group of amateurs most instrumental in providing exceptional DX activity, the award is of an international nature. Once each year, the 12 past recipients will be reconsidered and a permanent wall plaque of unique design awarded to the year's outstanding DXer.

NORTHERN IRELAND REGIONAL MEETING

Bangor, Co. Down

Saturday, May 2, 1959

Why not take the XYL along and spend the weekend in Bangor?

Tickets, price £1/1/- each, may be obtained from the Regional Representative, J. W. Douglas (GI3IWD), 54 Kingsway Park, Cherryvalley, Belfast, from whom further details may be obtained.

Aurora Research Station in Scotland

A RESEARCH station to study the effects of the aurora on radio reception is to be set up at Hillhead near Fraserburgh in Aberdeenshire. The site has been chosen because of its geographical suitability for the study of aurora phenomena.

The research, part of a programme of ionospheric studies, will be undertaken by the Stanford Research Institute of America in collaboration with scientists from the Royal Radar Establishment of the Ministry of Supply. Observations will be made with a large parabolic reflector about 140 ft. in diameter. The experiments are expected to start in the late spring or early summer and will last one or two years. The cost will be borne by the Americans.

CQ Single Sideband Handbook

THE new *Sideband Handbook* published by Cowan Publishing Corporation of New York, is now available from R.S.G.B. Headquarters price 25/- post free.

R.S.G.B. QSL Bureau Sub-Managers

THE following is a list of the R.S.G.B. QSL Bureau Sub-Managers showing the call-sign groups for which they are responsible:

G2 and DL2 calls:	**G. Verrill (G3IEC), 10 Seahorse Street, Gosport, Hants. (Certificates Manager).**
G3, 4 and 5 two-letter calls & GC	**P. Jones (G3ESY), 94 Holme Lacy Road, Hereford.**
G6 calls:	**A. J. Mathews (G6QM), 62 Ashlands Road, Hesters Way Estate, Cheltenham.**
G8 calls:	**A. W. Gover (G4AU), 20A, Cambridge Road, Bromley, Kent.**
G3AAA-BZZ:	**M. Hassall (G3EMD), 99 Shenstone Valley Road, Quinton, Birmingham.**
G3CAA-DZZ:	**C. A. Bradbury (B.R.S. 1066), 13 Salisbury Avenue, Cheltenham.**
G3EAA-HZZ:	**W. J. Green (G3FBA), 82 Bloomfield Avenue Bath.**
G3IAA-KZZ, B.R.S. and A numbers	**C. Usher (G2CCD), 24 Carlisle Road, Dartford, Kent.**
G3LAA-MZZ:	**G. C. Voller (G3JUL), 13 Marlborough Road, Ashford, Middlesex.**
G3NAA onwards	**G. Verrill, (G3IEC), 10 Seahorse Street, Gosport, Hants.**
GD calls:	**T. R. Moore (GD3ENK), "Glyn Moar," St. John's, Isle of Man.**
GI calls:	**W. H. Martin (GI5HV), "Swallow Lodge," Greenisland, Co. Antrim, Northern Ireland.**
GM calls:	**D. Macadie (GM6MD), 154 Kingsacre Road, Glasgow, S.4.**
GW calls:	**J. L. Reid (GW3ANU), 28 Walterston Road, Gabalfa, Cardiff.**

Envelopes for the *collection* of cards should be sent direct to the Sub-Manager concerned and not to the QSL Manager (Mr. A. O. Milne). Outgoing cards should not be sent to the Sub-Manager unless they are in the call-sign group for which he holds envelopes. For example, the holder of G3J-- call may send cards for calls in the series G3IAA-G3KZZ to his own Sub-Manager, together with envelopes for the collection of cards, but he should not send to him cards in any other call-sign series. Sending cards for general distribution to the Sub-Managers only involves the cards in delay and the Society in needless expense.

Mr. Milne's address is 29 Kechill Gardens, Bromley, Kent.

Society News

Radio Amateurs' Examination—Late Entries accepted up to March 22

MEMBERS who wish to obtain an Amateur (Sound) Licence are reminded that they must pass the Radio Amateurs' Examination as evidence of possessing the requisite theoretical technical knowledge and also the Post Office Morse Test within one year of applying for the licence.

The 1959 examination, set by the City and Guilds of London Institute, will take place on May 8. Readers who intend to sit for this particular examination should already have sent in their application but in exceptional circumstances late entries will be accepted up to March 22, 1959, on payment of an additional fee of 20/-. The normal fee is 20/-.

The address of the City and Guilds of London Institute is 76 Portland Place, London, W.1.

Vacancy on the Council Zone A Representative Ballot

Mr. A. C. Dunn (G2ACD) of Bridlington and Mr. P. H. Wade (G2BPJ) of Leeds, having been duly nominated to fill the vacancy on the Council for the office of Zone A Representative, a Ballot now becomes necessary.

Corporate Members resident in Zone A (Regions 1 and 2) are invited to record a vote for one of the two candidates in the form prescribed below.

Ballot for Zone A Representative

I wish to record my vote in favour of Mr..... for the vacant office of Zone A representative. I certify that I am a fully paid-up Corporate Member of the Society.

Ballot Papers must be posted in *sealed envelopes* containing no other communication. Envelopes must be marked " Ballot " and addressed to the General Secretary, Radio Society of Great Britain, New Ruskin House, Little Russell Street, London, W.C.1, to arrive not later than 12 noon on Tuesday, March 31, 1959. The envelope must be signed by the member voting who must state his call-sign or B.R.S. number on the outside of the envelope only. The Ballot Paper itself must not be signed.

Only Corporate Members resident in Regions 1 and 2 may vote.

Mr. Dunn was nominated by Messrs.: J. H. Jones (G3GBH); J. H. Hargreaves (G5VO); D. P. Tipper (G3JBR); R. S. Scales (B.R.S. 21598); S. Stephenson (G3KS); P. B. Briscombe (G8KU); Gordon H. Brown (G3FVW); R. C. Philpot (B.R.S. 2359); K. Barnes (G3KMB) and H. P. Wiggins (G2CP).

Mr. Wade was nominated by Messrs.: J. W. Swinnerton (G2YS); W. R. Metcalfe (G3DQ); A. M. Scott (B.R.S. 21903); S. P. Saltners (B.R.S. 21737); B. O'Brien (G2AMV); A. D. H. Looney (G3LIU); H. James (G3MCN); R. L. Kenyon (B.R.S. 19608); R. Halhead (G3KOR) and K. Sutton (G3FWL).

MULLARD AWARD 1958

In view of the fact that members were allowed only one month to submit nominations for the 1958 Mullard Award the Council has decided to extend the closing date for nominations to March 31, 1959.

Society representatives and Honorary Secretaries of affiliated societies are asked to make a special point of bringing the rules for the Mullard Award to the notice of members. The rules were published in full in the December 1958 and January 1959 issues of the R.S.G.B. Bulletin.

Forthcoming O.R.M.s

IN addition to the meetings already arranged to take place in Region 1 (Blackpool) on April 12 and in Region 15 (Bangor, Northern Ireland) on May 2, the Council has authorized the Regional Representatives concerned to hold meetings in Region 7 (London), Region 10 (Cardiff), Region 14 (Ayr and Glasgow), and Region 17 (Portsmouth). The Cardiff meeting will take place at the Park Hotel on Saturday, September 26, the Ayr meeting on Saturday, September 12, and the Glasgow meeting on Sunday, September 13. The Portsmouth meeting will probably take place during the weekend October 10-11 and the London meeting during the weekend October 24-25.

London Lecture Meeting

ABOUT 25 members were present at the Institution of Electrical Engineers on Friday, February 27, 1959, when Mr. K. W. Drummond of Mullard Ltd. lectured on " Recent Developments in the Microwave Field."

The chair was taken by Mr. L. E. Newnham, G6NZ (Immediate Past President) and a vote of thanks to the lecturer was proposed by Mr. R. C. Hills (G3HRH).

Current Comment

Continued from page 425

national Amateur Radio society existed in Canada. Mr. Wadsworth and his colleagues knew that such a society *should* be formed but they were aware too of the problems involved—the greatest of which they recognized as being the remoteness of the Canadian provinces one with another. *The Canadian Amateur* could well become the means of breaking down that remoteness and it *could* lead, in due time, to the formation of The Radio Society of Canada. It would be wrong to suggest that the present link between the United States and Canada is not satisfactory from an Amateur Radio point of view but there can be little doubt that many amateurs in Canada would be proud to become founder members of a Canadian National Society with an elected governing body.

Good luck and a long life to *The Canadian Amateur*.

J.C.

Council Proceedings

Résumé of the Minutes of the Proceedings at a Meeting of the Council of the Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1. on Thursday, January 22, 1959, at 6 p.m.

Present: The President (Dr. R. L. Smith-Rose in the Chair), Messrs. H. A. Bartlett, N. Caws, C. H. L. Edwards, K. E. S. Ellis, D. A. Findlay, W. J. Green, J. H. Hum, J. D. Kay, A. O. Milne, L. E. Newnham, W. A. Scarr, A. C. Williams, E. W. Yeomanson (Members of the Council), John Clarricoats (General Secretary) and John A. Rouse (Deputy General Secretary).

Apologies for Absence: The Secretary submitted apologies for the absence from the meeting of Messrs. E. G. Ingram and W. R. Metcalfe.

Absent: Mr. H. W. Mitchell.

* * *

TVI Problems

It was reported that at a recent meeting between representatives of the Society and the Post Office, TVI and associated problems were discussed. A report of the meeting would be considered by the TVI/BCI Committee and a précis submitted to the Council.

Financial Statement

In submitting a financial statement covering the six months to December 31, 1958, the Hon. Treasurer explained that an increase in BULLETIN production costs and postal charges plus the cost of sending delegates to the I.A.R.U. Region I Conference in Bad Godesberg were the items chiefly responsible for expenditure exceeding income during the first six months of the present financial year. Mr. Caws pointed out that a number of other items of expense incurred during the first six months would not recur during the second six months. In view of that he anticipated that income would exceed expenditure by about £370 at the end of the financial year.

Membership

Resolved (i) to elect 101 Corporate Members and 44 Associates; (ii) to grant Corporate Membership to six Associates who had applied for transfer; (iii) to grant Life Membership to Mr. J. P. Hawker (G3VA).

Applications for Affiliation

Resolved to grant affiliation to the Norwood Technical College Amateur Radio Club.

Annual General Meeting 1959

Resolved to hold the Annual General Meeting for the current year on Friday, December 11, at Over-Seas House, London.

In connection with the foregoing resolution the Council decided that a Saturday in December would not be a good day for the Annual General Meeting.

Constitution of Committees

The Committees of the Council were constituted for the year 1959 in accordance with the list published in the February issue of the Society's Journal.

Mullard Award

Resolved to appoint Messrs. Caws, Scarr, and the General Secretary to serve on the Mullard Award Committee for 1959.

QSL and V.H.F. Managers

Resolved (i) to re-appoint Mr. A. O. Milne to the office of QSL Manager for the year 1959; (ii) to re-appoint Mr. F. G. Lambeth to the office of V.H.F. Manager for the year 1959.

Mr. Milne was thanked by his colleagues for the yeoman service he had rendered to the Society in past years as QSL Manager. Reference was also made to the splendid work done for the Society by Mr. Lambeth in his capacity as V.H.F. Manager.

Finance Act 1958—Section 16

Resolved (by 7 votes to 5) that an application be made to the Commissioners of Inland Revenue for the Society to be "approved" under Section 16 of the Finance Act 1958.

Official Regional Meetings

Resolved (i) to enquire of the Representatives in Regions 6, 7, 8, 10, 11, 14, 16 and 17, whether they consider there would be sufficient support for an Official Meeting in their Region during the year 1959 to warrant the Council appointing representatives to attend; (ii) to authorize the Region 15 Representative to hold an O.R.M. in Bangor on May 2, 1959; (iii) to defer the appointment of Council representatives to attend the various O.R.M.s until a more complete programme is before the Council.

Ham Hop Club

Consideration was given to a request from the Ham Hop Club (British and Irish Division) that publicity be given to the Club from time to time in the R.S.G.B. BULLETIN.

Resolved to authorize the Editor to publish Ham Hop Club notes and news twice a year and to give further publicity to the Club by printing a short article outlining its activities.

N.F.D. Shield Replicas

Consideration was given to a request from the Gravesend Radio Society that the Council should award three separate miniature N.F.D. Shields (instead of one miniature) to that Society in recognition of the fact that they were leaders on 7, 14, and 21 Mc/s in addition to being overall winners of the 1958 N.F.D. event.

Resolved to accede to the request of the Gravesend Radio Society.

Reports of Committees

Resolved to receive as reports the Minutes of Meetings of the TVI/BCI and Exhibition Committees, and the Handbook Sub-Committee. After considering the report of the Handbook Sub-Committee, the Council *resolved* that a letter be sent to the Editor (Mr. S. K. Lewer) instructing him that all copy for the *Handbook* must be in the hands of the printers by May 31, 1959.

In order to speed up the production schedule and avoid duplication of effort it was further *resolved* that for the current year the Handbook Sub-Committee shall be an *ad hoc* Committee of the Council and not a Sub-Committee of the Technical Committee.

It was reported that as the draft Minutes of the Meeting of the R.A.E.N. Committee held on January 3, 1959, were not received at Headquarters until midday on Monday, January 19, 1959, it had not been possible to circulate them prior to the present meeting. The Hon. Secretary, R.A.E.N. Committee, had, however, forwarded to Headquarters an advance copy of the three recommendations adopted at the meeting and these had been circulated prior to the present meeting.

Resolved to defer consideration of the Minutes of the Meeting of the R.A.E.N. Committee held on January 3, 1959, until the February meeting of the Council.

As a matter of urgency the Council agreed to consider three recommendations adopted at a meeting of the V.H.F. Committee held on January 20, 1959. The recommendations dealt with (i) a proposal to revise the 2m band plan; (ii) the printing of copies of the new plan; (iii) a proposal that the Society's V.H.F. Manager should be invited to attend the Scottish V.H.F. Convention on March 14, 1959. *Resolved* to accept the recommendations.

R.S.G.B. Bulletin

Two members of the Council reported that complaints had been received regarding the late delivery of the January issue of the BULLETIN. The Secretary stated that the Society's printers had intimated that all but seven copies were delivered to the Hitchin Post Office on Thursday, January 15. Such delays as had occurred must therefore be attributed to the postal authorities.

The meeting terminated at 9.5 p.m.

Silent Keys

W. H. CHIPPERFIELD (B.R.S. 18450)

We record with sorrow the passing of Mr. W. H. Chipperfield (B.R.S. 18450) of Gateley, Cheadle, Cheshire. Those who were present at the Bridlington O.R.M. last September will remember him as the winner of the microphone. His main radio interests were with the Cadet forces on whose network he was the senior monitor station. He was keenly interested in the work of the Society and indirectly enrolled many members.

Sympathies are extended to his widow and to his son who is now doing his National Service. J.H.

J. GALLAUGHER (GI2CIZ)

We record with regret the death on January 28, 1959, of Jim Gallaugher (GI2CIZ). His passing is a sad blow to the Amateur Radio movement in Northern Ireland and he will be particularly missed by members of the City of Belfast Y.M.C.A. Radio Club. Although a keen radio enthusiast, Mr. Gallaugher was a man of varied interests and wide outlook. His other hobbies included amateur astronomy and photography. He was a supporter of many Y.M.C.A. activities.

On behalf of all Irish radio enthusiasts, at home and throughout the Commonwealth, we extend our sympathy to his brother and other relatives. J.B.

A. W. KNIGHT (G2LP)

It is our sad duty to record the passing of yet another Old Timer—A. W. Knight (G2LP) of Tolworth, Surrey. Mr. Knight was licensed just after the first World War and at about that time he helped to form the Wireless and Experimental Association which operated from Rye Lane, Peckham, London. Mr. Knight was especially active in the 1000m days and again when amateurs were allowed to use 440m. He was manager of one of the first wireless shops to be opened in South London and it was from his shop that many of the up-and-coming youngsters of pre-B.B.C. days obtained their bits and pieces.

The writer of this tribute recollects lecturing to the Wireless and Experimental Association under Mr. Knight's chairmanship early in 1920. In those days upwards of 50 attended every lecture.

To Mr. Knight's son Eric (who holds the call G3BNZ), to Mrs. Knight, senior, and to the other members of their family we offer sympathies and condolences in their great loss. J.C.

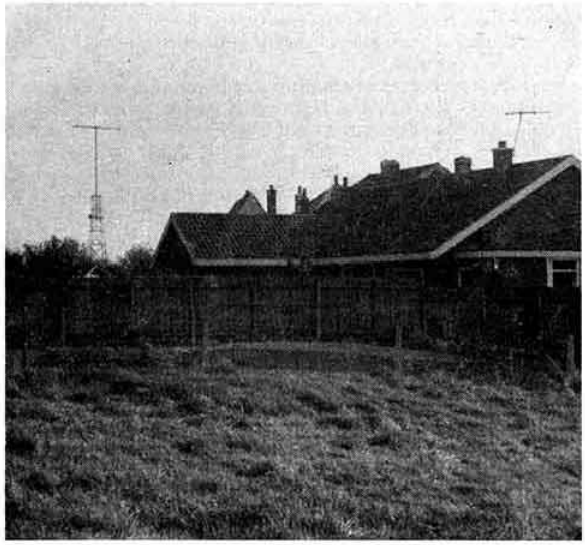
Another Aerial Mast Appeal Allowed

THE Minister of Housing and Local Government has allowed the appeal of Mr. William James (G6XM) of Burnside Grove, Tollerton, against a decision of the Nottinghamshire County Council not to allow him to erect an aerial mast in his garden.

The inspector's observations, after listening to the appeal, were as follows:

> " I cannot agree with either the Council or the objectors that this aerial mast is so very objectionable to see. It is so lightly constructed that one tends to see through it rather than at it and, in my opinion, it is of quite good appearance both as to colour and proportion. The open aspect of the surroundings attracts the eye much more than does the mast and makes the back garden seem larger than it is, and absorbs most of the impact of the mast. Such impact as it may have, in causing loss of visual amenity, is so little that it can be disregarded."

The Minister agreed with the views of his inspector that the mast causes little loss of visual amenity.



A view of the aerial mast at G6XM which was the subject of an appeal to the Minister of Housing and Local Government. The appeal was successful.

The Midland Amateur Radio Society took part for the first time in the Birmingham and Midland Institute's Conversazione held on January 13-16, 1959, the Society's exhibits occupying two large rooms. An amateur station was in operation using a KW50 transmitter and an Eddystone 888A receiver while all types of home-built equipment were on display. A recording of Sputnik signals was used to illustrate the amateur effort in the I.G.Y. The TV Group put on an excellent show with a closed circuit studio set-up and 21 in. monitors in various parts of the building.

(Photo by Holloway Studios)

" Gee Eye "

GEE EYE, a magazine for the radio amateurs of Northern Ireland, makes its first appearance this month. Edited by Mr. A. D. Patterson (GI3KYP) this new venture is intended to fulfil a need not normally met by other Amateur Radio publications. The Committee responsible for its production consists of a cross section of members suitably dispersed throughout Northern Ireland. Vol. 1, No. 1, comprises 12 foolscap pages of topical information produced by the duplicator process.

The annual subscription covering six issues has been fixed at 7/6 plus overseas postage. Orders should be sent to the Hon. Treasurer to the Committee, Mr. W. E. Caughey, 35 Gilnahirk Park, Cherryvalley, Belfast. Postal orders should not be crossed.

Good Luck, *Gee Eye.*

Exeter Group Again Active

THE Exeter Group has now been re-established with premises at Redcroft, Clifton Hill, Exeter. R.S.G.B. members and interested non-members are cordially invited to attend meetings of the Group which are held on the second Tuesday in the month from 7.30 p.m. Radio instruction classes are held weekly on Wednesdays at the same time. The local Top Band Net operates from 8 p.m. on Tuesdays.

Further details can be obtained from the T.R., J. D. Forward (G3HTA), 12 Clevedon Close, Pennsylvania, Exeter, or from the Group Secretary, P. Pavey (G3NFT), 45 Mincing Lake Road, Stoke Hill, Exeter.

Obituary

TWO names prominent in radio circles for more than 30 years passed from the world scene last month.

Mr. T. L. Eckersley, brother of Mr. P. P. Eckersley, was for many years associated with the Marconi Company, during which time, and subsequently, he made valuable contributions to radio research. He was the author of many books and papers.

Mr. F. J. Camm was Editor of several George Newnes publications but it was as Editor of *Practical Wireless* that he was known to tens of thousands of radio men. He had a very warm spot in his heart for the amateur—especially the newcomer—and he was a most staunch supporter of the R.S.G.B. His forthright editorials were a feature of *Practical Wireless* and other publications.

Pioneers, each in his own field. We mourn their passing.

Alec Higgins (G8GF) R.S.G.B. Region 3 Representative (right) with F. Bills (G3CLG) and I. T. Cashmore (G3BMY) (centre), at the Toc H Exhibition held recently in Lye, Stourbridge.

(Photo by A. K. Davies)

R.A.E.N. Notes and News

BY E. ARNOLD MATTHEWS (G3FZW)*

A RECENT letter from the Honorary Secretary of an Affiliated Society which is contemplating Network activity states that they cannot foresee the possibility of constructing special purpose equipment on the scale described in this column two months ago. It should be made quite clear that R.A.E.N. activity does not depend upon special equipment. Much can be achieved with what is to hand, and all groups start by using members' normal gear. By and large, such equipment is not designed in such a manner as will make it ideal for emergency use, but the problems arising from its use will not generally be found to affect actual communication. There will be difficulty in removal of fixed stations to emergency sites at various headquarters, and portable stations will not be in action from field sites so quickly as a true mobile. Thus, there will be a greater delay in establishing communications in local emergency than when so-called special equipment is used. This delay can be offset by consideration of the material available and assigning chosen equipment to specific tasks and practising a well developed removal drill at regular intervals.

Long distance disaster communications normally will be carried out by fixed stations. The only special equipment required here may be emergency power supplies for stations located within a disaster area.

Transmitting and Receiving Equipment in Cars

Inquiries have recently been received from members of the Radio Amateur Emergency Network regarding the insurance of vehicles used for emergency work. A member of the R.A.E.N. Committee, who asked his insurance company for a ruling, was assured that his motor policy covered the use of the car in emergency work. It was pointed out, however, that the policy did not cover radio transmitting and receiving equipment installed in the vehicle. The company stated that fire, theft and accidental damage cover could be provided separately at a cost of 10/- per cent. with a minimum annual premium of 10/-.

Members are strongly advised to ask their insurance companies whether they are in fact covered for the risks involved in work with R.A.E.N. and in ordinary mobile operation. Any member who has difficulty in arranging insurance for his radio equipment may obtain the name and address of the company mentioned in the preceding paragraph by sending a s.a.e. to Headquarters.

Southampton Group Surprise Call-out

On Sunday February 8 a police car delivered letters to G3GOP, G3ION and B.R.S.16075 initiating a test exercise laid on by the Chief Constable of Hampshire. It was assumed that all communications had been disrupted in the county. By 09.30 G.M.T.—only 30 minutes after the letters were delivered—eight stations were *en route* to various police stations in Hampshire—G3ION went to Police Headquarters, Winchester; G3GOP to Romsey; G3MRA to Micheldever; G3ARL to Newport, I.o.W.; G3HKT to Ferham; G3CGE to Hythe; G3JLS to Lyndhurst and G3KCJ to Ringwood, where they set up their portable 2 metre equipment. G3FAN, G3MDH, G3IBI and G3LOK acted as fixed relays for certain of the portables. All messages were passed correctly, the text being checked by the police at each station against duplicate originals. At the conclusion of the test the Chief Constable sent a message to all participants expressing his satisfaction and thanking them for their effort.

The group now has permission to make more permanent arrangements for a station in Winchester. Contact has been made with the Chief Constable of Southampton and the Group has been incorporated in the Borough "crash" scheme so that they will be automatically called out in the event of certain emergencies.

Trentham Mobile Rally

The organizers of this function have invited R.A.E.N. to provide part of the programme. Last year's Rally afforded an opportunity for the writer to meet many members, and he hopes to meet many more at Trentham on April 26.

Around the Groups

Essex Group has been incorporated into the County Disaster Plan to provide communications for Police and B.R.C.S. Call-out will be under Police arrangements. The County Controller's plan to use listeners' assistance in call-out procedure was given useful publicity recently in the *West Essex Gazette*.

Plymouth Group is developing steadily and is working up a firm liaison with Cornwall and the newly formed **Torbay** Group. Another new group—at **Kings Lynn**—will strengthen the Norfolk Group. G3SZ is acting A.C. and SWL J. Wheatley is his deputy. Recruiting appears to have got off to a good start. G3JLE is undertaking the preliminaries to the formation of a group in **Oxford.**

Birmingham C.C. G3CNV called a meeting at Sutton Coldfield on February 20 but was taken into hospital the day before; G3LNN deputized for him. We wish G3CNV a speedy and complete recovery. Kent's **Medway** Group recently held a meeting to discuss organizational matters concerning the East Coast Warning Network and routine nets. The **Cornwall** net has moved to 160 metres.

International Red Cross Test Transmissions

Although a number of members reported that the Geneva station had announced in the last series of tests that reports were no longer required the Hon. Secretary received, via B.R.C.S., details of a further series and details of the schedules. Report cards were issued to selected groups to give a representative coverage in the country.

Personnel

Messrs. M. C. Locke, Trewberry Cottage, Trewberry, Newquay, Cornwall, and K. J. Creamer, 26 Effingham Road, St. Andrews, Bristol, 6, have been appointed Area Controllers. E. Rayner (G6IO) has resigned from the office of A.C. for South London.

E. W. Yeomanson (G3IIR) has moved to 32 Gaynesford Road, Forest Hill, London, S.E.23, and R. R. Parsons (GI3HXV) to 45 Erinvale Avenue, Finaghy, Belfast.

R.A.E.N. Rally 1958

IN the results of the R.A.E.N. Rally 1958 published on page 389 of the February BULLETIN, the call-sign G3CUZ/M should have read G2CUZ/M.

Radio Amateurs' Examination

COMPREHENSIVE revision notes for the use of members who are preparing for the City and Guilds of London Institute examination on Friday, May 8, are available from Headquarters, price 1s. per set, post paid.

* *1 Shortbutts Lane, Lichfield, Staffs.*

Tests and Contests

Low Power Contest 1959

THE rules for the Low Power Contest on April 11 and 12 are the same as in previous years.

When: 18.00 G.M.T. to 23.00 G.M.T. on April 11 and 08.00 G.M.T. to 20.00 G.M.T. on April 12, 1959.

Eligible Entrants: All fully paid-up Corporate members of the R.S.G.B. resident in Europe.

Contacts: Must be made on c.w. (A1) only between 3500 and 3600 kc/s.
Scoring: Points will be scored on the following basis:

Watts input to p.a. stage	Up to 0·5	To 1	To 2	To 3	To 4	To 5
Points per contact ...	20	10	5	3	2	1

A bonus of 20 points may be claimed for the first contact with each different county code area listed below.

Contest Exchanges: RST reports followed by the contact number starting at 001 and the county code number, e.g. 559001 Nr. 17.

Logs: (a) Must be tabulated in columns headed (in this order) "Date/Time (G.M.T.)," "Call-sign of Station Contacted," "My report on His Signals and Serial Number Sent," "His Report on My Signals and Serial Number Received," "County Code No," "Input Power," "Points Claimed."

(b) The cover sheet must be made out in accordance with R.S.G.B Contests Rule 5 and the declaration signed.

(c) Details of the transmitter and power supply must be given, but circuit diagrams are no longer required.

(d) Entries must be postmarked not later than **April 27, 1959.**

Awards: At the discretion of the Council, the **1930 Committee** Cup will be awarded to the winner and certificates of merit to the runner-up and to the non-transmitting member submitting the best check log in the opinion of the Contests Committee. A certificate of merit will also be awarded to the non-transmitting member submitting the best check log in the opinion of the judges.

The General Rules for R.S.G.B. Contests published on page 348 of the January 1959 *Bulletin* apply to this contest.

COUNTY CODE NUMBERS

England (G).

1. Bedford	15. Hereford	28. Nottingham
2. Berkshire	16. Hertford	29. Oxford
3. Bucks	17. Huntingdon	30. Rutland
4. Cambridge	18. Kent	31. Shropshire
5. Cheshire	19. Lancashire	32. Somerset
6. Cornwall	20. Leicester	33. Stafford
7. Cumberland	21. Lincoln	34. Suffolk
8. Derby	22. London (Postal Districts)	35. Surrey
9. Devon		36. Sussex
10. Dorset	23. Middlesex	37. Warwick
11. Durham	24. Monmouth	38. Westmorland
12. Essex	25. Norfolk	39. Wiltshire
13. Gloucester	26. Northampton	40. Worcester
14. Hampshire	27. Northumberland	41. Yorkshire

Scotland (GM).

42. Aberdeen	54. Fife	66. Renfrew
43. Angus	55. Inverness	67. Ross & Cromarty
44. Argyll	56. Kincardine	68. Roxburgh
45. Ayr	57. Kinross	69. Selkirk
46. Banff	58. Kirkcudbright	70. Shetland
47. Berwick	59. Lanark	71. Stirling
48. Bute	60. Mid-Lothian	72. Sutherland
49. Caithness	61. Moray	73. West Lothian
50. Clackmannan	62. Nairn	74. Wigtown
51. Dumbarton	63. Orkney	
52. Dumfries	64. Peebles	
53. East Lothian	65. Perth	

Wales (GW).

75. Anglesey	79. Caernarvon	83. Merioneth
76. Brecknock	80. Denbigh	84. Montgomery
77. Cardigan	81. Flint	85. Pembroke
78. Carmarthen	82. Glamorgan	86. Radnor

Northern Ireland (GI).

87. Antrim	89. Down	91. Londonderry
88. Armagh	90. Fermanagh	92. Tyrone

Channel Islands (GC).

93. Alderney	95. Jersey	96. Sark
94. Guernsey		

97. Isle of Man (GD). 98. All Stations outside the United Kingdom.

Contests Diary

1959

March 21-22	**- A.R.R.L. DX Contest (C.W. Section)**
March 21-22	**- R.S.G.B. 1250 Mc/s Tests[1]**
April 4-5	**- Helvetia 22 Contest[1]**
April 11-12	**- R.S.G.B. Low Power Contest[1]**
May 3	- First 144 Mc/s Field Day (c.w. only)[2,4]
May 10	- D/F Qualifying Event (Oxford)
May 24	- D/F Qualifying Event (South Manchester)
May 24	- 420 Mc/s Contest
June 6-7	- National Field Day[3]
June 20-21	- First 70 Mc/s Contest
June 28	- D/F Qualifying Event (High Wycombe)
July 5	- Second 144 Mc/s Field Day[2]
July 12	- D/F Qualifying Event
September 5-6	- National V.H.F. Contest and European V.H.F. Contest[2]
September 6	- D/F National Final
September 20	- Low Power Field Day
September 27	- R.A.E.N.
November 7-8	- Second 1·8 Mc/s Contest
November 21-22	- R.S.G.B. Telephony Contest

[1] For details, see page 398, R.S.G.B *Bulletin*, February, 1959.
[2] These contests are arranged to take place during the periods suggested by the Region 1 V.H.F. Committee.
[3] For rules, see page 294, R.S.G.B. *Bulletin*, December, 1958.
[4] For details, see this page.

First 144 Mc/s Field Day, 1959

R.S.G.B. members throughout Europe are again invited to take part in this contest, the details of which are as follows. Contacts may be made on c.w. only.

When: 10.00 G.M.T. to 19.00 G.M.T. on Sunday, May 3, 1959.

Eligible Entrants: All fully paid-up members of the R.S.G.B. resident in Europe. Multiple-operator entries will be accepted provided only one call-sign is used.

Contacts: May be made on A1 only, with an input not exceeding 25 watts to any stage in the transmitter.

Scoring: Points will be scored on the basis of one point per kilometre for contacts with fixed stations and two points for contacts with other portables or mobiles. (Five miles may be taken as eight kilometres).

Contest Exchanges: RST reports followed by the band identification letter A and the contact number and location (e.g. RST559A001 5NE Luton).

Logs: (a) Must be tabulated in columns headed (in this order) "Date/Time (G.M.T.)," "Call-sign of Station Contacted," "My Report on his signals and Serial Number sent," "His report on my signals and Serial Number received," "Location of Station Contacted," "Distance," "Points Claimed."

(b) The cover sheet must be made out in accordance with R.S.G.B. Contests Rule 5 and the declaration signed.

(c) Entries must be postmarked not later than Monday, **May 18, 1959.**

Awards: At the discretion of the Council, a miniature cup will be awarded to the winner and a certificate of merit to the runner-up. A certificate of merit will also be awarded to the non-transmitting member submitting the best check log in the opinion of the judges.

The General Rules for R.S.G.B. Contests published on page 348 of the January 1959 *Bulletin* apply to the contest.

R.S.G.B. Contest Forms

SPECIALLY printed log forms and cover sheets for the use of members taking part in contests are now available from Headquarters on request.

Letters to the Editor . . .

Neither the Editor nor the Council of the Radio Society of Great Britain can accept responsibility for views expressed by correspondents.

Single Sideband Reception

DEAR SIR,—It is fairly obvious that Dr. Koster (G3ECA) was thinking of distortionless reception of s.s.b. signals, when writing of the difficulty experienced by some operators who use unmodified receivers. Commercial receivers vary enormously in their ability to hold and resolve s.s.b. One suspects, also, that much of the s.s.b. reception indulged in by the enthusiasts is not exactly distortionless. If one is prepared to put up with the results of a few cycles error in the injected carrier frequency, s.s.b. reception is relatively simple.

Reception of d.s.b.s.c. is not as difficult as Mr. Bagley (January issue) implies. Without going into details, the injected carrier has to be either in phase, or 180° out of phase, for distortionless reception. If an error of a few cycles is tolerated, the phase relationship between the injected and the original carrier will rotate at the difference frequency between the two, and the in and out of phase conditions will be swept through at twice this frequency. The dangerous phase conditions are when the two carriers are 90° or 270° apart, and these will obviously be swept through as well. The result will not be distortionless but should be intelligible.

It is worthwhile pointing out that if the carrier is reduced, and not completely suppressed, it is possible to receive d.s.b. without carrier injection at all. This may be done by using a sharp crystal filter to reduce the amplitude of the sidebands without reducing the carrier amplitude, so that the effective modulation depth becomes less than 100 per cent, when a diode detector can deal with it without distortion.

A cynic might suggest that the solution of the interference trouble on Top Band lies in the use of s.s.b. Not only would the interference to coast stations be reduced by more than half, but it would also be much more difficult for the stations causing the interference to be identified!

Yours faithfully,

Hull, Yorks. A. G. DUNN (G3PL).

Local Interference

DEAR SIR,—How interesting was the letter from G3IUP (February BULLETIN) concerning local interference. I, too, am stricken with this menace—a café on one side and a garage on the other. All this starts from approximately 09.00 and continues to 22.00/23.00. Top Band is impossible, "80" is reasonably workable after approximately 21.00 only, 40 and 20 likewise. There is no interference on TV or BC.

One cannot help but notice that while we as amateurs have to pass an examination to ensure that we will not cause interference with "other wireless telegraphy" it is also incumbent upon us to put it right if we do. But any Tom, Dick or Harry can buy an electrical appliance, connect it up, switch on, cause non-stop interference with "other wireless telegraphy" on short-waves and get away with it. There is nothing to stop him. I wrote to the G.P.O. about this but they weren't very interested. I was told that the bill for such an investigation would be passed to me and would cost from £50 to £1,000. I would rather go QRT than support the apparent sagging finances of the Government.

A burst of interference now and again is commonplace and to a certain point tolerable but 12 to 14 hours a day, seven days a week, unchecked. . . . Well what do you think, Mr. Editor?

Yours faithfully,

HAROLD D. FAWCETT (G3LVF).

East Twickenham, Middlesex.

Value for Money

DEAR SIR,—What's burning 'em up in Pontefract? Recent correspondence showed them to be "off the beam" and now G3ESP is all adrift (December).

As a prime mover for the equalization of subscriptions I'll try and explain the position to G3ESP.

I have examined the accounts as published in November and can't find anything that G3ESP pays for and doesn't get.

If he feels that he shouldn't pay for the I.E.E. I can credit him with something less than 2d., but seeing he gets many of the lectures in the BULLETIN (which information would probably not appear but for I.E.E.) and he should pay something towards the reception of foreign and provincial visitors (usually a fair proportion of those attending), he'll owe us something back.

The Exhibitions cost him 4d. but as they earn 7d. for him he owes the workers about 3d.

The Hobbies Exhibition is put on by a private member at his own expense (G3ESP doesn't read what he pays for) and this showed us a net profit of £26 after our Exhibition expenses had been paid and exclusive of the increase of membership which relieved G3ESP of some of his responsibilities. (He is a guarantor of the Company in liquidation for a sum not exceeding £1 1s. 0d.: more members, less liability.)

Seeing G4KD guarantees us a profit, surely one can't blame him for putting up a £400 receiver "to bring them in," non-members as well. Had they not come in G4KD would have been "holding the baby" without hurt to G3ESP. If G4KD "broke even" he was lucky.

All this earned G3ESP reduction in subscription, but the Luncheon Club didn't, because it, like the UHF Group, is run by private effort and cash; the Society gets the advantage with no cost to us.

G3ESP hasn't yet realized that we're all equal as members of the Society, which is run for us by some of us, but we're not in the same class when it comes to fortune; some have and some have not, and this applies to QTH, QRO or even QRT.

As to being a country bumpkin and there being much activity in London, I wonder what he calls the chaps in Llanon in wildest Wales, or the fellow in Killin in the Scottish Highlands? (I never heard a complaint from either.)

When it comes to activity, I guess by G3ESP standards I'm due to some sub-reduction; there's at least half a dozen amateurs within a few hundred ether yards of me. If G3ESP has a case he should claim tax reductions because of London's Theatres, Underground and British Museum.

Doesn't G3ESP realize that if Manchester, Sheffield or Leeds can find a G4KD that he can obtain a loan, have his expenses paid and loss, if any, too, provided always that the Council is "sold" on a proposition, which means, in effect, the R.S.G.B. supports its members anywhere.

Many members from the provinces serve on Council, and others attend A.G.M., so why not G3ESP—his answer must resolve all the queries in his letter—and although I'm not absolutely certain legally, I can't see that the A.G.M. can be held anywhere but London, the registered seat of the Company's offices.

Come on G3ESP, snap out of it—this is a Society of Amateurs who belong because they are Amateurs who want to be on the inside, not outside—an association of mutual benefit and interest, as far as is practical; one gives and is thankful to receive.

Yours faithfully,

Seven Kings, Essex. W. H. MATTHEWS (G2CD).

Contest Dates

DEAR SIR,—Would it be possible for a little more thought to be put into planning the dates on which R.S.G.B. Contests are held?

As a keen contest enthusiast I would like to point out that it is possible for me to participate in only about 50 per cent of the events in the *Contests Diary* list. This is because so many contests take place on the same day or weekend. For example, the first and second ARRL DX Contests (which are of world-wide appeal) clash with the Affiliated Societies' Contest and the short Top Band Contest, while the third ARRL DX Contest clashes with the 144 Mc/s Open Contest and the fourth with the 1250 Mc/s Tests. This seems to be absolutely ridiculous, since several weekends are left completely devoid of contests.

Yours faithfully,

Mitcham, Surrey. M. PHARAOH (G3LCH).

Golden Jubilee

DEAR SIR,—I am gratified that Golden Jubilee celebrations are being considered because here is a " window-dressing " act which could mean so much to the Society.

Suggestions are that Exhibitions be held in cities which have a good coverage of population—London, Birmingham (or Manchester), Exeter, Cardiff, Newcastle, Edinburgh, Belfast, and that these functions should not clash.

The President in 1963 should be a man whose contribution to Amateur Radio has been outstanding throughout the years.

An issue of specially attractive QSL cards to be made (to be paid for by members, of course).

The organization of an International Field Day in which all Member Societies of the I.A.R.U. be asked to participate, there being one team per country (U.K. being represented by the 1963 N.F.D. winners). All foreign stations would have a British " manager " and would have a G0 call issued for the contest duration (say 48 hours). For instance, DL might be G0RD/DL; Ukraine, G0VA/UB and so on. The sites would be chosen by British amateurs in conjunction with the foreign countries. All participants to receive a memento and the winners to receive a handsome trophy with medals for first three placings. There would need to be close co-operation with the British G.P.O. in order that temporary " tickets " be issued.

Perhaps these suggestions (controversial though they may be) will encourage other R.S.G.B. members to think about the Golden Jubilee.

Yours faithfully,

Jersey, Channel Isles. ERNEST BANKS (GC2CNC).

Two Metre Calls Heard and Worked

DEAR SIR,—I note with regret the discontinuance of the 2 metre list of inter-G stations heard. I would like to point out that for this county, which is behind the " iron curtain " as regards 2 metre signals, any signal over 50 miles is DX to us unfortunate listeners. Not so long ago the R.S.G.B. was appealing for more enthusiasm on the 2 metre band, and now that enthusiasm has been worked up, it is suddenly suppressed. I agree with G2JF and G2HDR on the point that many operators like to know where their signals have been heard. Perhaps the shortwave listeners are no longer of sufficient importance to justify their reports appearing in print; certainly the dropping of their reports is hardly a way to encourage new entrants.

Yours faithfully,

G. STOKES (B.R.S.21136).

Editorial Note: Lists of two metre stations heard by listener members will still be published but in the interests of space such lists should be restricted to stations over 50 miles away.

Aerials and Snow Storms

DEAR SIR,—During a heavy snow storm in the early hours of a recent January morning sparking was heard to be taking place in my main transmitter, which was not switched on. Investigation showed that it was occurring between the centre of the aerial tuning coil and the two-turn link which surrounded it. The link is of No. 14 s.w.g. covered with ceramic beads, the turns being close wound over the centre of the coil. After a short time the sparking stopped at the coil and started up across the plates of the aerial tuning condenser—a Cyldon split stator, gap 0·068 in. The r.f. thermocouple ammeter in series with the single feeder was showing a rhythmic reading in step with the sparking and on peaks rose to 1 amp.

The aerial is a " VS1AA" 35 ft. high, consisting of 279 ft. of No. 8 h.d.c., the feeder being of No. 14 s.w.g. Insulation is of a very high standard. Needless to say, the aerial was earthed until the storm passed! In the old days, condensers in series with an aerial had a spark gap built in: *circa* 1916.

Yours faithfully,

Inverness, Scotland. J. MACINTOSH (GM3IAA).

Technical Note

The phenomenon mentioned by Mr. MacIntosh is quite well known although it is not very common in the United Kingdom because conditions involving electrically charged rain or snow usually do not occur at times of low humidity. If the humidity is high, as it usually is in the U.K., there is sufficient leakage on the aerial installation to discharge the aerial. If the humidity is low such charges can build up into quite high voltages. This effect is much more noticeable in countries such as Canada.

Crystals for S.S.B.—Manufacturers Please Note

DEAR SIR,—To help further the progress of single sideband in this country, I feel it would be a great help if one of the crystal manufacturers could offer for sale a set of crystals for receiver and transmitter, comprising say three for the receiver (two for the bandpass amplifier stage, and one for the b.f.o.) and five for the transmitter (four for the filter, and one for the first oscillator) or even ready built units, pre-aligned, with i.f. transformers, which would eliminate the need for an accurate signal generator to be owned by the amateur. When choosing a crystal for a b.f.o. for reception of s.s.b., am I correct in assuming that its frequency should be approximately 1·5 kc/s lower, or higher, than the centre frequency of the filter bandpass, to give correct response?

Yours faithfully,

London, S.W.4. P. J. BALL (G3HQT).

DX Contests
Frequency Restrictions Proposed

DEAR SIR,—Some time ago I wrote to ask whether it would be possible for the organizers of DX Contests to confine the events for which they are responsible to a *portion* of each band.

I see in the February issue of the BULLETIN that a new Scandinavian DX event is planned for the autumn. With an ever increasing number of such events fewer and fewer weekends are now free of contests.

As it is a well-known fact that only a minority of DX enthusiasts are contest minded is it in keeping with the Spirit of Amateur Radio that this minority should, on so many weekends each year, make it well nigh impossible for the majority to enjoy their hobby?

If the organizers of c.w. contests would include in their rules a stipulation to the effect that the bottom half only of each band is to be used for contacts it would enable the rest of us to operate more or less normally in the other half.

A DX phone contest would be a little more complicated to organize by reason of the U.S. and Canadian phone bands but the following arrangement would seem to present possibilities.

Contest Stations	Non-Contest Stations
14·15-14·25 Mc/s	14·1 -14·15 Mc/s
	14·25-14·35 Mc/s
21·2 -21·35 Mc/s	21·15-21·2 Mc/s
	21·35-21·45 Mc/s
28·3 -29 Mc/s	28·2 -28·3 Mc/s
	29·0 -29·7 Mc/s

With the introduction of the Scandinavian contest and with the knowledge that more and more DX events are occupying up to four weekends a year (the A.R.R.L. C.W. Contest for example runs over two weekends as does the A.R.R.L. Phone Contest). I should like to appeal to contest organizers everywhere to consider seriously my suggestion. I would also like the I.A.R.U. to tackle the general question of DX contests with a view to reducing the number of such events to a figure more in keeping with minority interests.

Incidentally those who operate mobile during a DX contest have little hope of enjoying a proper QSO.

Yours faithfully,

London, N.W.3. E. W. WAGNER (G3BID).

London Meeting

Friday, March 20, 1959

" Single Sideband Techniques "

by B. J. Rogers, G3ILI (Bush Radio Ltd.)

at the

Institution of Electrical Engineers
Savoy Place, Victoria Embankment

Buffet Tea 6 p.m. **Lecture 6.30 p.m.**

Regional and Club News

Aberdeen Members' Luncheon Club.—Meetings of this new club are to be held at the Royal Atheneum Restaurant, Union Street, at 12.45 p.m. on the first Tuesday of each month. All Society members will be cordially welcomed. A special invitation is extended to amateurs visiting the city whether from home or abroad. Reservations may be made up to the day preceding each meeting by contacting G. Jamieson (GM3HTL), telephone number Aberdeen 34928.

Aldershot and District Amateur Radio Society.—Recent activities have included participation in the Affiliated Societies' Contest. Morse practice classes are held regularly. The A.G.M. is arranged for March 18 at " The Cannon," Victoria Road, Aldershot. *Hon. Secretary:* S. E. Hume, 25 Kingsway, Aldershot.

Amateur Radio Club of Nottingham.—Recent activities have included a talk by G3ATL on " Civil Defence Communications Systems," a lecture by G3QC on " The Electronic Reproduction of Music by Waveforms " and participation in the Affiliated Societies' Contest. Meetings are held on Tuesdays and Thursdays at 7.15 p.m. at Woodthorpe House, Mansfield Road, Nottingham. Morse practice classes, constructional facilities and a club station are amongst the amenities available. *Hon. Secretary:* E. C. Weatherall, 16 Avebury Close, Clifton, Nottingham.

Bradford Amateur Radio Society.—There was an attendance of nearly 250 at the lecture on " Colour Television " by Dr. G. N. Patchett, Head of the Department of Electrical Engineering at Bradford Institute of Technology. The lecture was illustrated with demonstrations and the equipment was available for inspection. Other recent lectures have included " Transmitter Design and Construction " by G3KEP. The A.G.M. will take place on March 24 and a lecture on Stereophonic Sound on April 7. Anyone interested in radio or television is cordially invited to attend meetings which commence at 7.30 p.m. and are held at Cambridge House, 66 Little Horton Lane, Bradford 5. *Hon. Secretary:* David M. Pratt (G3KEP), " Glenluce," Lyndale Road, Eldwick, Bingley, Yorkshire.

Bristol.—A large gathering of members and their ladies attended the annual Film Show organized by John Dear (B.R.S. 19985) with Ted Halliday (G3JMY) as projectionist. About 50 members were present on February 20 to hear Harry Gratton (G6GN) talk on the application and adjustment of relays. At the same meeting, the " G5FS Memorial Challenge Trophy " was presented to P. W. Crouch (G3GBK) in recognition of his lecture on TVI Suppression in 1958. On March 20 G3JMY will be speaking about " Transmission Lines and Tuned Circuits." *Hon. Secretary:* D. F. Davies (G3RQ), 51 Theresa Avenue, Bishopston, Bristol 7.

Cambridge and District Amateur Radio Club.—The A.G.M. will be held at the " Jolly Waterman," Chesterton Road, Cambridge, on March 20, commencing at 7.45 p.m. *Hon. Secretary:* H. Waton (G3GGJ), " Arkengathdale," New Road, Barton, Cambridge.

Cheltenham.—At the best attended A.G.M. for several years, the T.R. referred to the friendly co-operation between the Group and the Cheltenham Amateur Radio Society, many of the events and visits during 1958 being combined ventures. The main items of the evening were discussions on the forthcoming Cheltenham Mobile Rally (May 10) and the possibility of holding an O.R.M., the latter depending on support from other groups in the Region. It seems certain that the Rally will be even more successful than the previous one if the enthusiasm and the excellent proposals put forward are any criterion.

Cornish Radio and Television Club.—At the February meeting, when arrangements for the May Hamfest were discussed, G3LPB/T gave a talk on basic television troubles and their cures. R.A.E.N. is now functioning well in the county. *Hon. Secretary:* J. Brown (G3LPB/T), Marlborough Farm, Falmouth, Cornwall.

Derby and District Amateur Radio Society.—At the A.G.M. it was reported that the fully paid membership is now 120. The following officers were elected: *Chairman*—T. Darn (G3FGY); *Hon. Treasurer*—H. Shaw; *Hon. Secretary*—F. C. Ward (G2CVV), 5 Uplands Avenue, Littleover, Derby. The President, Mr. A. G. G. Melville, presented certificates to M. Shardlow, Jr., winner of the G5YY Trophy for the 40m contest held on January 11, and to N. J. Birkett (G3EKX), winner of the President's Trophy for the 1958 Direction Finding Contest. Meetings are held each week at the School of Arts and Crafts, Green Lane, Derby, and any radio enthusiast who cares to attend will be most welcome. The Society's mobile rally will be held on August 16.

Flintshire Radio Society.—At the A.G.M. held on February 2 F. G. Southworth (GW2CCU) was elected the society's first president. Other officers elected were: *Chairman*—D. C. Morris (GW2FVZ); *Hon. Secretary*—J. T. Lawrence (GW3JGA/T), " Perranporth," 9 East Avenue, Bryn Newydd, Prestatyn; *Hon. Treasurer*—P. F. Jones (GW3FPF). Details of future meetings are given in *Forthcoming Events.*

Grafton Radio Society.—Recent events have included talks by P. F. Cundy, G2MQ (M-O Valve Co.) on " Aspects of Valve Manufacture "), F. Judd (G2BCX) on " Stereophonic Recording and Reproduction " and E. Alban on " Measurements in the Ham Shack." Junk Sales and a " Brain of Grafton " quiz have also been well supported. The club's annual Top Band Contest for the G2AAN Cup is now in progress. *Hon. Secretary:* A. W. H. Wennell (G2CJN), 145 Uxendon Hill, Wembley Park, Middlesex.

Guildford and District Radio Society.—Details of this newly-formed society may be obtained from A. P. Carrington (G3EWE), " Nepeta," Stringers Common, Guildford. All local radio amateurs, shortwave listeners and radio enthusiasts are assured of a warm welcome.

Halifax and District Amateur Radio Society.—At the February meeting there was a good attendance to hear a talk on DX-peditions by M. Whittaker (G3IGW). Details of future arrangements are given in *Forthcoming Events. Hon. Secretary:* A. Robinson (G3MDW), Candy Cabin, Ogden, Halifax.

Lothians Radio Society.—Meetings will be held at 25 Charlotte Square, Edinburgh, at 7.30 p.m. on March 19 (N.F.D. Discussion), April 2 (Surplus Sale) April 16 (" TVI—Its Causes and Cures "). *Hon. Secretary:* L. Lumsden, 33 Hillview, Edinburgh 12.

Newbury and District Amateur Radio Society.—The February issue of the society's *Newsletter* reflects the serious preparations being made for this year's N.F.D. and contains an analysis of " how the winner's did it " for several years back. Meetings have been arranged for March 27 (Technical Forum) and April 24 (A.G.M.) at Elliotts of Newbury Canteen, West Street, Newbury, commencing in both cases at 7.30 p.m. *Hon. Secretary:* J. A. Gale (G3LLK), " Wild Hedges," Crookham Common, near Newbury.

North Kent Radio Society.—C. J. Leal's (G3ISX) talk on " The Construction and Testing of Domestic Watt-Hour Meters " will be given on March 26 and not as incorrectly stated in *Regional and Club News* last month. A film show has been arranged for April 9, and will include " The Principles of the Transistor." Meetings are held on the second and fourth Thursdays in each month at the Congregational Hall, opposite Bexleyheath Clock Tower, commencing at 7.30 p.m. *Hon. Secretary:* D. W. Wooderson (G3HKX), 39 Woolwich Road, Bexleyheath.

Plymouth Radio Club.—Meetings are held on Tuesday evenings at the Virginia House Settlement, The Barbican, commencing at 7.30 p.m. On March 17 there will be the competition for the " Ernie Hillyard " Trophy and on April 28 for the G5ZT Trophy. Both trophies will be presented at the A.G.M. on May 5. *Hon. Secretary:* A. W. Phillips (G3NBX), 8 Merrifield Terrace, Torpoint, Cornwall.

Purley and District Radio Club.—The club social was held on February 20. A Junk Sale is arranged for March 20 and a library has been started. Meetings are held at the Railwaymen's Hall, Whytecliffe Road, Purley. *Hon. Secretary:* E. R. Honeywood (G3GKF), 105 Whytecliffe Road, Purley.

Shefford and District Amateur Radio Society.—Meetings are held on Friday evenings at Digswell House, commencing at 7.45 p.m. After a short Morse session, the main programme begins. Refreshments are available. On March 20 there will be a demonstration by I. Howard (G2DUS/T). N.F.D. preparations will be discussed on April 3, R. Hirst will give a talk on fault finding procedure on April 10, a film show is arranged for April 17 and a Morse evening for April 24. Prospective members and visitors are always welcome. *Hon. Secretary:* G. R. Cobb (G3IXG), Western House, Ampthill Road, Shefford, Beds.

South Shields and District Amateur Radio Club.—The club will again be operating GB3SFS from the South Shields Annual Flower Show on August 14, 15 and 16 at Bents Park Recreation Ground. A Mobile Rally will be held on August 16 to coincide with the Flower Show. *Hon. Secretary:* K. Sketheway (B.R.S. 20185), 51 Baret Road, Walkergate, Newcastle upon Tyne 6.

Stockport Radio Society.—The highlight of recent activities was an Amateur Television demonstration. G3AYT and other members will be taking part in the First 144 Mc/s Field Day on May 3. A Mobile Rally, organized in conjunction with the South Manchester Radio Club, will take place on August 30. Details of future meetings are given in *Forthcoming Events*.

Stourbridge and District Amateur Radio Society.—Recent lectures and demonstrations have included 144 Mc/s operation, stereophonic sound and operating and safety. There was a record attendance at the Annual Dinner. *Hon. Secretary:* A. K. Davies, 48 Church Avenue, Vicarage Road, Amblecote, near Stourbridge.

Torbay Amateur Radio Society.—Recent meetings have included discussions on R.A.E.N., N.F.D. arrangements and the judging of members' work for the Construction Cup. G3MYL and G3LHJ have completed fitting connectors to headsets at the Hawkmoor Hospital while G3ABU is helping to sort out pre-amplifier and line problems for the distribution system. *Hon. Secretary:* G. A. Western (G3LFL), 118 Salisbury Avenue, Barton, Torquay.

Wells and District Amateur Radio Club.—The next meeting of this newly formed club will be held at the Globe Inn, Wells, on March 24, commencing at 7 p.m. Further information may be obtained from C. Reed, 12 Knowle Lane, Wookey, Wells.

Representation

THE following are additions to the list of Town Representatives published in the December 1957 issue:

REGION 7
SURREY—GUILDFORD AND WOKING
T. L. PAINTER (G3NEU), Almondbury, Carter's Lane, Old Woking.
REGION 16
NORFOLK—NORWICH AREA
H. J. B. WESTERN (G3MSP), Sgts' Mess, R.A.F. Watton, Thetford.

Affiliated Societies' Representatives

THE following have been appointed Affiliated Societies' Representatives for 1959:

ACTON, BRENTFORD & CHISWICK RADIO CLUB: W. G. Dyer (G3GEH), 188 Gunnersbury Avenue, Acton, London, W.3.
BARNET & DISTRICT RADIO CLUB: K. R. Clarke (G3KRC), 24 Galley Lane, Barnet, Herts.
CIVIL SERVICE RADIO SOCIETY: D. E. Tomkinson (G3IIE), 24 Mead Way, Coulsdon, Surrey.
STOCKPORT RADIO SOCIETY: A. Smith (G3AYT), 27 Redgate, Hyde, Cheshire.
THANET RADIO SOCIETY (G3DOE): J. P. Barnes (G3BKT), 18 Grange Road, Ramsgate, Kent.

London Mobile Rally

THE London Short Wave Club is arranging a rally in the Festival Gardens, Battersea, on September 6. Accommodation for up to 500 mobiles will be available as well as moorings for waterborne stations. Three rally stations will be in operation—one on Top Band, another on 2m and the third on the DX bands. Other attractions will include displays of Amateur Television and radio controlled model boats. All the normal facilities of the Festival Gardens will be available to those attending the rally.

Further information may be obtained from K. R. Piper (G3LOO), 2 Catherina Terrace, Stockwell, London, S.W.8.

Daystrom Heathkit Hi-fi Demonstrations

DURING the period of the London Audio Fair, from April 2 to 5 inclusive, demonstrations of Heathkit high fidelity equipment will be given at the Royal Hotel, Russell Square, London.

Slow Morse Practice Transmissions

G.M.T.	Call-sign	kc/s	Town
Sundays			
09.00	G3BHS	1810	Southampton
10.30	G3FFA	1935	Barnet
11.00	G3GZE	1840	Blackburn
11.00	G2FXA	1900	Stockton-on-Tees
12.00	G3LP	1850	Cheltenham
12.00	GI5UR	1860	Belfast
15.00	G3LEQ	1900	Tunbridge Wells
20.00	G3MRA	1915	Southampton
20.30	G3HTA	1850	Exeter
21.00	G2FIX	1812	near Salisbury
Mondays			
18.00	G3GZE	1840	Blackburn
18.30	G3NC	1825	Swindon
19.00	G3KTP	1850	Heanor, Derby
19.00	G3LMT	1850	Exeter
20.00	G3MDH	1915	Southampton
20.30	G3AGN	1875	Felixstowe
20.30	G3MXI	1910	Derby
21.30†	G3LGK	1980	Ilkeston, Derbys.
	G3MXI	1980	West Hallam, Derbys.
Tuesdays			
17.30	G2AAM	1875	Swanwick, Derbys.
18.00	G3GZE	1840	Blackburn
18.30	G2FXA	1900	Stockton-on-Tees
20.00	G2FCI	1850	Exeter
20.00	G3BHS	1915	Southampton
20.00	G3NHR	1900	Hounslow
20.15	G2AYQ	1875	St. Agnes, Cornwall
21.00	G3EFA	1855	Southport
21.15	G2CPL	1875	Felixstowe
21.45	G2UK	1875	Lowestoft
Wednesdays			
18.00	G3GZE	1840	Blackburn
19.00†	G3MCJ	1845	Exeter
	G3FLK		
	G2FCI		
	G3HTA		
19.00	G3LZC	1830	Heanor, Derby
19.00	G8RQ	1850	Chesterfield
19.30	G3BIA	1900	Twickenham
20.00	G3IBI	1915	Southampton

G.M.T.	Call-sign	kc/s	Town
Wednesdays			
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3MXI	1910	Derby
21.00	G3BHS	1810	Southampton
22.00	G3JJC	1990	S.E. London
22.00†	G3LGK	1980	Ilkeston, Derbys.
	G3MXI	1980	West Hallam, Derbys.
Thursdays			
17.30	G2AAM	1981	Swanwick, Derbys.
18.30	G3NC	1825	Swindon
19.00	G3LXL	1850	Nottingham
20.00†	G2ABR	1919	Hull, Yorks.
	G3FCY		
21.00	G3GWT		
	G3KTO		
20.00	G3NBV	1915	Southampton
20.00	G3NHR	1900	Hounslow
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3GDZ	1910	Kingsbury, N.W.9
21.00	G3BHS	1810	Southampton
21.30	G3HMY	1850	Exeter
22.00	G3JIT	1990	S.E. London
Fridays			
18.30	G3DMN	1880	Ipswich
	G3FVP		
19.30	G3FUA	1850	Kilburn, Derby
19.30	G3MHR	1850	Swanwick, Derbys.
20.00	G3JLS	1915	Southampton
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3ICX	1915	Sutton Coldfield
20.30	G3KGU	1915	Theydon Bois, Essex
21.00	G3BHS	1810	Southampton
21.30†	G3KLZ	1900	Bradford
	G3KSS		
22.00	G3KYU	1859	Bournemouth
22.00†	G3LGK	1980	Ilkeston, Derbys.
	G3MXI	1980	West Hallam, Derbys.
Saturdays			
09.00	G3MRA	1915	Southampton
13.00	G2FXA	1900	Stockton-on-Tees
14.30	G3BIA	1900	Twickenham
20.00	G3MCL	1915	Southampton

† *Alternately.*
* *Slow Morse QSO.*

The International Ham Hop Club

THE British and Irish Division of the International Ham Hop Club was inaugurated at the Annual General Meeting of the I.H.H.C. held at the R.S.G.B. Radio Hobbies Exhibition last November. Under the Presidency of P. W. Winsford (G4DC) the Division has been active in taking over the work of the Club within the British Isles. A German-speaking Division has been formed on similar lines to co-ordinate the activities of members in this language-area.

An interesting account of the first intercontinental " ham hops "—made by G3KZR and G3MIK (both students at Cambridge University) through the United States and Canada—is given in the latest number of " Ham Hop News." W6THN is now due in the U.K. for a short " ham hop " before settling down to a programme of medical research.

The Club is grateful to W0GDH who is sending over plates for printing a specially designed I.H.H.C. QSL card. Specimen cards will be circulated to members as soon as they are available.

The following remarks by DJ2SY are apt: " Two subjects have constantly cropped up in correspondence. The one answers the other and at the same time they give guidance for the future. Part of the Hamhoppers complained last season of not being considered for giving accommodation. Now it happens that there are more hosts than travellers. Mainly from non-members has the fear been expressed that the hosts would be exploited by the travellers. The above gives the answer. The majority of our members do not have the opportunity of greeting a fellow amateur in their own home or have the pleasure of entertaining a guest through an organized tour."

This also is very true of members in this country. To keep the Club active more visits need to be made. Holidays are now being planned. Why not include some " ham hops " in the itinerary?

The Club appreciates the co-operation of the Council of the R.S.G.B. who have authorized the Editor to publish H.H.C. News in the BULLETIN twice a year, in March and September.

G3KAW.

Communications Receivers, etc.

IN FIRST CLASS CONDITION

HAMMARLUND SP.600, 540 kc/s-54 Mc/s, listed £350 ...	**£280**
G.E.C., BRT.400	**£95**
EDDYSTONE 680X, 480 kc/s-30 Mc/s	**£85**
GELOSO G209 all amateur bands	**£75**
R.C.A. AR88D, 540 kc/s-32 Mc/s	**£65**
R.C.A. AR88LF, 75-550 kc/s and 1·5-30 Mc/s	**£60**
EDDYSTONE 750, listed at £78	**£58**
HALLICRAFTERS S.36, U.H.F. AM/FM, 28-143 Mc/s ...	**£50**
HALLICRAFTERS SX28, 550 kc/s-42 Mc/s	**£45**
HAMMARLUND Super Pro, with power unit	**£35**
NATIONAL NC. 100.XA, 500 kc/s-30 Mc/s	**£35**
NATIONAL NC. 120, 540 kc/s-30 Mc/s	**£35**
EDDYSTONE 840, 540 kc/s-30 Mc/s	**£35**
EDDYSTONE 740	**£35**
R.C.A. AR77E, 540 kc/s-31 Mc/s	**£32**
HALLICRAFTERS S.27, U.H.F. AM/FM, 28-143 Mc/s ...	**£30**
BC342N Unmodified	**£25**
BC348 RECEIVER, modified for mains	**£25**
HALLICRAFTERS S.38C, 550 kc/s-30 Mc/s	**£25**
HALLICRAFTERS SX.16, 550 kc/s-61 Mc/s	**£25**
HALLICRAFTERS SX.25, 550 kc/s-42 Mc/s	**£25**
MARCONI CR. 100, 60-420 kc/s and 500 kc/s-30 Mc/s ...	**£25**
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* Denotes transfer to Corporate Grade.
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Forthcoming Events

Details for inclusion in this feature *must* reach the appropriate Regional Representatives *not later than the 18th of the month* preceding publication. T.R.s and club secretaries are reminded that the information submitted *must* include the date, time and venue of the meeting and, whenever possible, details of the lecture or other event being arranged. Regional Representatives are requested to set out copy in the style used below.

REGION 1

Blackpool (B. & F.A.R.S.).—Tuesdays, 7.30 p.m., Squires Gate Holiday Camp.
Bury (B.R.S.).—March 24 (Visit to Mullards, Simonstone); April 14 (Talk by G2HW); George Hotel, Kay Gardens.
Liverpool (L. & D.A.R.S.).—Tuesdays, Gladstone Mission Hall, Queens Drive, Stoneycroft.
Macclesfield.—March 24, April 7, 21, 8 p.m., "The Bruce Arms," Crompson Road.
Manchester (M. & D.R.S.).—April 6 ("Surplus Equipment," by F. Nicholls, G3MAX), 7.30 p.m., Brunswick Hotel, Piccadilly, Manchester.
Manchester (S.M.R.C.).—April 3, Ladybarn House, 17 Mauldeth Road, Fallowfield, Manchester 20.
Preston (P.A.S.).—March 18 (Practical Evening); April 1 ("Indoor Antennas," by N. Lowe), 8 p.m., The Fruiterers' Club, High Street. (Morse practice from 7.30 to 8 p.m.)
Stoc'port (S.R.S.).—March 21, Spring Fair, Southwood Road School, Great Moor (Closed circuit TV and Radio Station); March 25 (A.G.M.); April 8 ("U.H.F." by G3AYT), 8 p.m., Blossoms Hotel, Buxton Road.
Wirral (W.A.R.S.).—March 20, April 3, 17, 7.45 p.m., 4 Hamilton Square, Birkenhead.

REGION 2

Bradford (B.A.R.S.).—March 24 (A.G.M.), April 7 ("Stereophonic Sound Reproduction," F. Thistlewaite), 7.30 p.m., Cambridge House, 66 Little Horton Lane. April 21—Visit to Esholt Sewage Works.
Halifax (H. & D.A.R.S.).—March 17 (Social); April 7 (Quiz); April 21 (Ragchew), Sportsman Inn, Ogden.

REGION 3

Birmingham (M.A.R.S.).—March 17, April 2 (TV Lecture/Demonstration), 7.30 p.m., Midland Institute. (Slade).—March 27 ("Construction and Use of Test Equipment," G3HHD and G3HKC), 7.45 p.m., Church House, High Street, Erdington.
Coventry.—March 20, 7.30 p.m., Vine Street Schools. (C.A.R.S.).—March 16 (Quiz), March 23 ("Two Metres," G2LU), 7.45 p.m., 9 Queens Road.
Stourbridge & District.—March 20, 8 p.m., White Horse, Amblecote; April 7 ("G4ZU Beam," by G3CLG), 8 p.m., Brotherhood Hall, Scotts Road.

REGION 4

Derby (D. & D.A.R.S.).—March 18, March 25 (Film Talk on British West Indies, by G. Smith of Kingston, Jamaica.). April 1 (Auction Sale). April 8 (Talk on Iraq with colour transparencies, by B. Dare G3JFT, ex-YI3AA). 7.30 p.m., Room 4, 119 Green Lane, Derby. April 15 (Visit to British Celanese Ltd., No. 1 Works (Petro-chemicals)).
Derby (D.S.W.Exp.S.).—Sundays, 10.30 a.m. March 19, 26, April 2, 9, 16, 7.30 p.m., Club Room, Nunsfield House, Boulton Street, Alvaston.
Leicester (L.R.S.).—March 16, 23, April 6, 13, 7.30 p.m., Old Hall Farm, Braunstone Lane, Leicester.
Lincoln (L.S.W.C.).—March 25, April 1, 15 (R.A.E. Classes), 7.30 p.m., Technical College, Cathedral Street.

LONDON MEMBERS' LUNCHEON CLUB

will meet at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road,
at 12.30 p.m. on Friday, March 20 and Friday, April 17, 1959
Telephone table reservations to HOL 7373 prior to day of luncheon. Visiting amateurs especially welcome.

REGION 6

Cheltenham.—First Thursday in each month, 8 p.m., Great Western Hotel, Clarence Street.
High Wycombe.—March 25 ("N.F.D." and Rag Chew), 7.30 p.m., G3FAS, 51 Tyzack Road, Totteridge.
Oxford (O. & D.A.R.S.).—March 25, 7.30 p.m., Cherwell Hotel, Water Eaton Road.

REGION 7

Acton, Brentford & Chiswick.—March 17 (Field Day Discussion), March 24 ("SSB," by G2QY), 7.30 p.m., A.E.U. Rooms, 66 High Road, Chiswick.
Barnet (B. & D.R.C.).—March 31 ("Aerial Demonstration," F. Charman, B.E.M., G6CJ), 7.30 p.m., Red Lion Hotel, High Barnet.
Croydon (S.R.C.C.)—April 14, 7.30 p.m. (A.G.M.), "Blacksmith's Arms," South End, Croydon.
Ealing.—Sundays, 11 a.m., A.B.C. Restaurant, Ealing Broadway, W.5.
East London.—March 15, 2.30 p.m., Ilford Town Hall (Film Show including "Ilford N.F.D. 1948").
East Molesey (T.V.A.R.T.S.).—April 8 ("Printed Circuitry," F. Hicks Arnold, G6MB), Carnarvon Castle Hotel, Hampton Court.
Finsbury Park.—March 17, April 14, 7.30 p.m. For venue of meeting 'Phone Can 2970.
Harlow & District.—Tuesdays, 7.30 p.m., rear of G3ERN (G. E. Read).
Holloway (G.R.S.).—Mondays and Wednesdays (RAE and Morse), Fridays (Morse and Club), 7 p.m., Montem School, Hornsey Road, N.7.
Ilford.—Thursdays, 8 p.m., G2BRH, 579 High Road, Ilford.
Kingston.—Lecture alternate Thursdays, 7.45 p.m., Theory and Morse Classes weekly, 5 Penrhyn Road, Kingston, Surrey.
Norwood & South London.—First Tuesday in each month (R.A.E. and Morse classes), 7.30 p.m., Windermere House, Westow Street, Crystal Palace.
Romford (R.D.A.R.S.).—Tuesdays, 8.15 p.m., R.A.F.A. House, 18 Carlton Road, Romford, Essex.
Slough.—April 6, 7.45 p.m., Stag Hotel, Wexham Street, Wexham.
South Kensington (C.S.R.S.)—April 14, 6 p.m. (A.G.M.), Demonstration Room, Science Museum, South Kensington.
Welwyn Garden City.—April 9 ("70 cm. Night"—Amateur and Professional Equipment for 435 Mc/s), I.C.I., Recreation Club, Blackfan Road, Welwyn Garden City.

REGION 9

Bath.—March 16, April 13, 7.30 p.m., 12 James Street West, Bath.
Bristol.—March 20 ("Transmission Lines and Tuned Circuits," E. C. Halliday, G3JMY), April 17 ("Mobile Operating," C. H. L. Edwards, G8TL), 7.15 p.m., Carwardines Restaurant, Baldwin Street.
Exeter.—April 9 (Film Night), 7.30 p.m., Redcroft, Clifton Hill, Exeter.
Torquay.—April 11, 7.30 p.m.. Y.M.C.A., Castle Road, Torquay.
Wells.—March 24, 7.15 p.m., Globe Hotel, Wells.
Yeovil.—March 18, 25, April 1, 8, 15, 7.30 p.m., Grove House, Preston Road. Yeovil.

REGION 10

Cardiff.—April 13, May 11, (Final Field Day arrangements), 7.30 p.m. "The British Volunteer," The Hayes.

REGION 11

Prestatyn (F.R.S.).—March 16 (Field Days Discussion); April 6 (Junk Sale); April 20 (N.F.D. Discussion), 7.30 p.m., Railway Hotel, Prestatyn.

REGION 12

Aberdeen.—April 7, 12.45 p.m., Aberdeen Members' Luncheon Club, Royal Atheneum, Union Street (Reservations to GM3HTL).

REGION 13

Edinburgh (L.R.S.).—March 19 ("N.F.D. Preparation"), April 2 (Surplus Sale), April 16 ("TVI Causes and Cures"), 7.30 p.m., 25 Charlotte Square.

REGION 14

Falkirk.—April 10, 7.30 p.m., Temperance Café.
Glasgow.—March 20 ("Beginners' Night"), 7.30 p.m., Christian Institute, 70 Bothwell Street, Glasgow C.2.

DATES FOR YOUR DIARY

March 17-21.—Electrical Engineers' Exhibition, London.
March 20.—London Lecture Meeting.
April 12.—Blackpool O.R.M.
April 26.—North Midlands Mobile Rally.
May 2.—Bangor (N.I.) O.R.M.
May 3.—Cornish Hamfest and Mobile Rally, Penryn.
May 10.—Cheltenham Mobile Rally.
May 21-27.—International Transistor Exhibition, London.
May 30.—Fifth International V.H.F./U.H.F. Convention, London.
June 14.—Longleat Mobile Rally.
June 28.—Worthing "Bucket and Spade" Party.
August 16.—Derby Mobile Rally (Provisional).
August 16.—South Shields Mobile Rally.
August 26-September 5.—National Radio Show, London.
August 30.—G6UT's Ham Party.
August 30.—South Manchester and Stockport Mobile Rally.
September 6.—London Mobile Rally.
September 13.—Woburn Abbey Mobile Rally (Provisional).
September 20.—Lincoln Hamfest and Mobile Rally.
November 25-28.—R.S.G.B. Radio Hobbies Exhibition.

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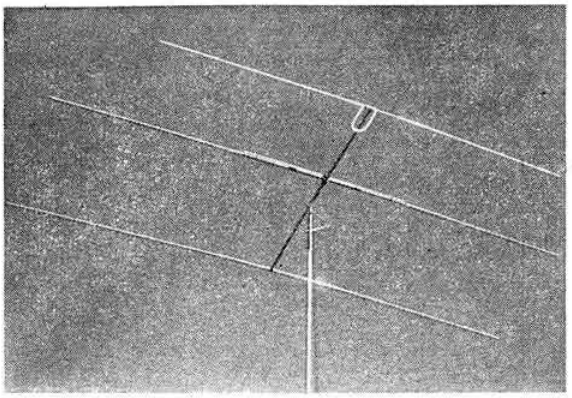

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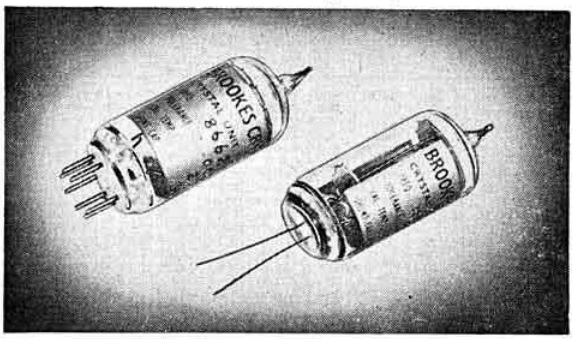

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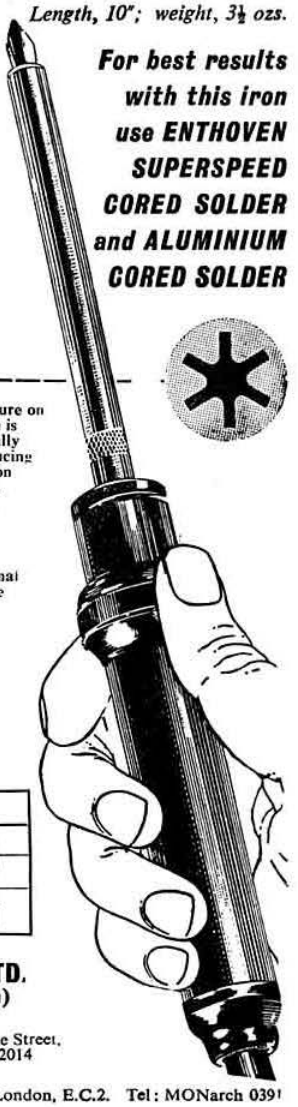

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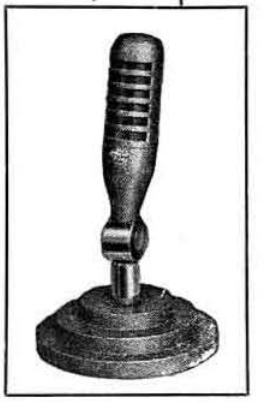

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(continued on page 464)

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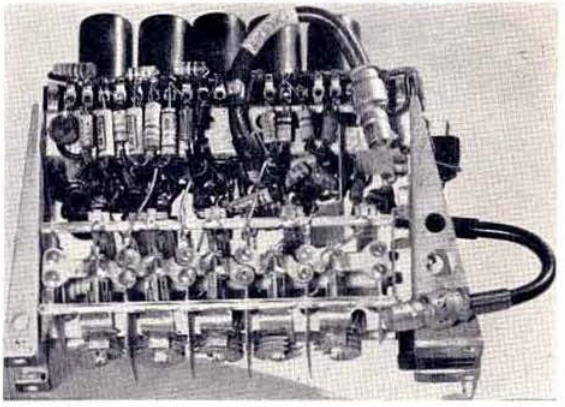

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